EPA/ROD/R02-94/224
1994

EPA Superfund
Record of Decision:

FRIED INDUSTRIES
EPA ID: NJD041828906
OU 01
EAST BRUNSWICK TOWNSHIP, NJ
06/27/1994

PB94-963801
EPA/ROD/R02-94/224
July 1994

EPA Superfund
Record of Decision:

Fried Industries Site,
East Brunswick, NJ

RECORD OF DECISION

Fried Industries Site

Township of East Brunswick, Middlesex County, New Jersey

United States Environmental Protection Agency
Region II
New York, New York

June, 1994

ROD FACT SHEET

SITE	
Name :	FRIED INDUSTRIES
Location/State :	East Brunswick Township, Middlesex County, New Jersey
EPA Region :	II
HRS Score (date):	33.61 (June 1986 NPL Ranking: 565/703)
ROD Date Signed:	June 27, 1994
Remedy/ies:	Ground water: Pump and Treat (chemical precipitation and activated carbon) Soil: Off-site stabilization and disposal of arseniccontaminated soil; off-site treatment and disposal of VOCs-contaminated soil.
Operating Unit Number:	OU-1
Capital cost:	$5,000,500 (in 1993 dollars)
Construction Completion:	March, 1998
O & M in 1988: (after completion of Remedy in 1988)	$476,500 (in 1993 dollars)
Present worth: (Capital Cost + O&M)	$10,956,900 (7% discount rate/30 years)
LEAD	
Remedial/Enforcement:	Remedial
EPA/State/PRP:	EPA-Lead
Primary contact:	Thomas Porucznik (RPM) (212) 264-7609
Secondary contact:	Charles Tenerella (Section Chief) (212) 264-9382
Main PRP(s);	Phillip Fried (sole PRP)
PRP Contact:	Samuel V. Convery, Jr. (PRP's Attorney) 137 Main Street/P.O. Box 551 Metuchen, New Jersey 08840
WASTE	
Type:	Arsenic, VOCs
Medium:	Ground Water, soil
Origin:	Discharge of process water, poor storage and operating practices, deteriorating drums
Estimated Quantities:	900 cu. yds. Arsenic-contaminated soil 2700 cu. yds. VOCs-contaminatred soils (includes 400 cu. yds. of soil contaminated with arsenic and VOCs) Additional deep bedrock wells will be drilled at start of design phase to estimate the volume of ground water to be treated

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Fried Industries

Township of East Brunswick, Middlesex County, New Jersey

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Fried Industries Site, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act, as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision document is based on the administrative record file for this Site.

The New Jersey Department of Environmental Protection and Energy concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Fried Industries Site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy represents the first and only planned operable unit for the Fried Industries Site. It addresses contaminated surface soils on the site and groundwater contamination in the underlying shallow and deep aquifers.

The major components of the selected remedy include the following:

- Excavation, and off-site treatment and disposal, of approximately 900 cubic yards of surface soil contaminated with arsenic;

- Excavation, and off-site treatment and disposal, of approximately 2,700 cubic yards of soil contaminated with volatile organics;

- Extraction of groundwater contaminated with volatile organics from the bedrock and shallow aquifers, with on-site treatment and discharge to surface water; and

- Appropriate environmental monitoring to ensure the effectiveness of the remedy.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. If any effluent limitation for discharge to Bog Brook is not technically achievable within the range of the treatment system identified in the Feasibility Study and this Record of Decision, the Environmental Protection Agency, in conjunction with the New Jersey Department of Environmental Protection and Energy, may either relocate the treated groundwater discharge to Lawrence Brook to meet that limitation, or waive the effluent limitation for Bog Brook. The remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, and it satisfies the statutory preference for remedies that employ treatment which reduces toxicity, mobility, or volume as their principal element.

Because this remedy will result in hazardous substances remaining on the site above health-based levels

(contaminated groundwater), a review will be conducted within five years after commencement of the remedial action to ensure that it continues to provide adequate protection of human health and the environment.

6/27/94

William J. Muszynski, P.E.
Deputy Regional Administrator

Date

RECORD OF DECISION
DECISION SUMMARY

Fried Industries Site

Township of East Brunswick, Middlesex County, New Jersey

United States Environmental Protection Agency
Region II
New York, New York

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SITE NAME, LOCATION, AND DESCRIPTION

The Fried Industries Superfund Site (the Site) is located at 11 Fresh Ponds Road, in the Township of East Brunswick, Middlesex County, New Jersey (Figure 1).

Approximately 25,000 persons live within 3/4 mile of the Site. The closest community, with a population of about 7,000 persons, is Milltown, whose center lies approximately 3/4 mile north of the Fried Industries Site. The Site is located approximately 1 mile southeast of Route 1, and about 1.2 miles from three shopping malls located at the intersection of Routes 1 and 130. %B2North Brunswick High School is located about 1 mile from Fried Industries.

The Fried Industries property is approximately 26 acres in size, occupying Lot 20.03, Block 308.19 on the Township of East Brunswick Tax Map. The property encloses a pond, a marsh area, several other separate wetlands areas, woodland/upland areas, and a building complex (Figure 2). The building complex occupies about three acres, and is comprised of several single story buildings/structures, a staging/loading area, several above-ground and below-ground storage tanks, a number of trailers, and an abandoned railroad boxcar. Wetlands occupy approximately 70 percent of the total Site acreage, including a three-acre pond resulting from excavations predating Fried Industries operations (Figure 3). The Site is drained by two unnamed streams which flow into Bog Brook. Bog Brook, in turn, empties into Lawrence Brook, a tributary to the Raritan River.

The Site is roughly rectangular in shape, bordered on the northeast by a strip of land adjoining Bog Brook, on the northwest by a residential area, on the southeast by Fresh Ponds Road, and on the southwest by a swamp and undeveloped woodland. The sole entrance to the Site is in the southeast part of the property, about a quarter mile southwest of the juncture of Dutch Road and Fresh Ponds Road. A dirt road leads from the entrance gate to the building complex.

As recently as ten years ago, the deep bedrock aquifer supplied many of the residences in the area with potable water. At the present time, neither of the two aquifers (the deep bedrock and the Farrington Sand aquifers) is being used as a source of potable water in the immediate vicinity of the Site. Residences located along Fresh Ponds Road no longer make use of private wells and are now being serviced by a public water supply obtained from a surface water source. Although there are approximately 150 wells located within a three-mile radius of the Site, the nearest well immediately downgradient of the contaminated ground-water plume is about 1/4 mile from the Site. Since the contaminated ground-water plume lies entirely within Site bound aries, this well has not been impacted by Site contamination.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

From 1906 to 1920, the Milltown Sand and Clay Company operated a clay pit on the Fried Industries Site property. After quarry operations concluded, no significant activities at the Site occurred until 1965, when the East Brunswick Planning Board granted permission to manufacture detergents and floor finishers on the current Fried Industries Site property. In 1985, Mr. Philip Fried, the owner of the property and the company, agreed to cease all manufacturing and production operations.

During the years that Fried Industries operated at this location, the company manufactured industrial strength aqueous detergent solutions, floor finishing products, adhesives, and algicides. Products were formulated using chemicals purchased in bulk quantities. Ingredients included xylene, butyl cellosolve, methyl carbitol, sodium metasilicate, formaldehyde, sodium tripolyphosphate, ammonia, methylene chloride, soap, surfactants, mineral spirits, and quaternary amines, among other chemicals. In addition, Fried Industries produced chemical products from components such as toluene and 1,1,1-trichloroethane. At times, Mr. Fried also leased Site facilities to other companies for the manufacture of automotive antifreeze products, including ethylene glycol and methanol.

In July 1983, the Township of East Brunswick Department of Health (EBDOH) received a complaint from a resident living on Fresh Ponds Road regarding taste and odor problems in water from the resident's well. The EBDOH confirmed the presence of contamination in the area by analyzing samples from five homes along Fresh Ponds Road. All five wells were contaminated with volatile organics (VOCs), including chloroform at

concentrations up to 250 parts per billion (ppb). Because of a possible threat to human health, the Township connected a number of residents in the area to the public water supply.

In August 1983, representatives from the EBDOH and the Middlesex County Department of Health (now the Department of Environmental Health) analyzed well water and septic tank samples from the Fried Industries Site, revealing a wide range of volatile organic contaminants, at concentrations up to 2000 ppb. In December 1983, a task force comprised of federal, state, county, and township agencies, and headed by the Environmental Protection Agency (EPA), obtained a search warrant and investigated the Fried Industries Site. Along with evidence of soil contamination caused by chemical spills, analysis of the samples obtained during this investigation revealed that hazardous wastes were improperly stored on the Site.

Subsequent investigations revealed evidence of numerous sources of contamination, including deteriorated buried drums, drum spill areas, and stained soil areas. Process waste waters and contaminated water from the drum storage and handling areas were discharged directly onto the ground. Other sources of contamination included leaking and improperly stored drums, abandoned laboratory equipment and chemicals, and contaminated process and septic tanks. Historical aerial photographs also indicate extensive soil disturbances on the Fried Industries Site.

Based on the information obtained during these early Site investigations, EPA proposed the Fried Industries Site for inclusion on the National Priorities List (NPL) in October 1984. The Site was added as part of the June 1986 update to the NPL, making it eligible for cleanup under EPA's Superfund program.

EPA notified Mr. Fried, via letter dated April 30, 1985, that it intended to conduct a Remedial Investigation & Feasibility Study (RI/FS) at the Site. This study was subsequently undertaken by contractors funded by EPA. On May 26, 1987, a Consent Decree was entered in the U.S. District Court, District of New Jersey, relating to the Site. Under the terms of that Decree, Mr. Fried agreed to cease all manufacturing and production operations at the Site, and to allow federal officials and agents to enter the Site for activities related to the RI/FS.

In December 1987, EPA awarded a contract to Ebasco Services, Incorporated (Ebasco) to conduct an RI at the Site. The main purposes of the remedial investigation were to determine the physical characteristics of the Site and the sources of contamination, to evaluate the nature, magnitude, and extent of contamination, and to characterize the potential health risks and environmental impacts of the contaminants present at the Site.

Data obtained during the initial remedial investigation (Phase I RI) indicated significant organic and inorganic contamination in the vicinity of the Site buildings. In order to accurately characterize and delineate the contamination discovered in the Phase I RI, EPA conducted a supplemental study (Phase II RI). Ebasco began work on the Phase II RI in October 1991. The Phase II RI included additional soil borings and monitoring wells, an aquifer pump test, a wetlands evaluation, and analyses of samples taken from surface water, ground water, sediments, surface soils, subsurface soils, and test pits. The Phase II RI was finalized in September 1993.

During the initial remedial investigation, EPA determined that many of the drums and containers at the Site contained hazardous materials. Analytical results indicated there was a significant risk to human health and the environment due to the ignitable, toxic, and/or corrosive nature of the materials in the drums and containers. To eliminate this immediate threat, EPA authorized a Superfund Removal Action in September 1989 to install a security fence around the building complex, and to remove, and properly dispose of, nearly 1200 drums/containers and 4200 laboratory items containing solid and liquid hazardous materials. This significant action was completed in February 1992 at a cost of approximately $1.5 million. Removing the containerized hazardous materials, securing the Site with a fence around the building complex, and providing public water to residences in the area greatly reduced the immediate threat of exposure to hazardous substances.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

A public meeting was held in the East Brunswick Courthouse on August 18, 1988 to review the proposed RI activities. EPA discussed conditions at the Site, and the objectives of the investigation activities described in an RI Work Plan.

A public availability session was held in the East Brunswick Public Library on March 4, 1992 to discuss the results of the completed Phase I RI and the scope of the impending Phase II RI. Between the public meeting and the availability session, the public was kept informed of EPA activities by distributing several Fact Sheets.

The Phase II RI report, FS report, and the Proposed Plan for the Site were released to the public for comment on September 9, 1993. These documents were made available to the public in the administrative record file at the EPA Docket Room in Region II, 26 Federal Plaza, New York, NY, and the information repository at:

Reference Desk
East Brunswick Public Library
2 Jean Walling Civic Center Drive
East Brunswick, NJ 08816

The notice of availability for the above-referenced documents was published in the Home News on September 8, 1993. The public comment period on these documents was held from September 9, 1993 to October 8, 1993.

On September 21, 1993, EPA conducted a public meeting at the East Brunswick Senior Center to inform local officials and interested citizens about the Superfund process, to discuss the findings of the RI, FS, and proposed remedial activities at the Site, and to respond to any questions from area residents and other attendees.

EPA responses to the comments received at the public meeting, and in writing during the public comment period, are included in the Responsiveness Summary section of this Record of Decision.

SCOPE AND ROLE OF RESPONSE ACTION

EPA has decided to address the Site in one operable unit which will address all remaining risks at the Site.

Therefore, this Record of Decision (ROD) will address remedial alternatives for surface soils and for ground water, and is expected to be the only ROD for the Fried Industries Site.

During the design, if significant contamination is found in the underground storage tanks and tank car remaining on the Site, the contaminated tanks, and any associated soil contamination, will be removed and treated as part of the remedial action.

EPA previously conducted a removal action, completed in 1992. This action addressed deteriorating drums, buckets, and other vessels containing hazardous materials. During the design, if significant soil contamination is found in the areas that were used for staging drums, the contaminated soil will be removed and treated as part of the remedial action.

To ensure the safety of on-site workers, and to facilitate heavy equipment operations in implementing the selected remedy, the building complex will be demolished to eliminate the physical hazards associated with these unsafe structures. If significant soil contamination is found beneath the main building, the contaminated soil will also be removed and treated as part of the remedial action.

Data obtained during the RI suggests the possible presence of concentrated areas of contamination in the ground water, and perhaps the soil, in the vicinity of Wells #8 and #14. Additional sampling will determine the need to remove any such ground water and/or soil "hot spots", thereby facilitating the removal of contaminants from ground water during the remedial action stage.

SUMMARY OF SITE CHARACTERISTICS

An RI was performed to determine the type and concentrations of contaminants in various media at and around the Site. Samples were collected from surface and subsurface soils, ground water, surface water, air, and the building. Details of the results of these sampling efforts may be found in the RI reports. The collected samples were analyzed using the EPA Contract Laboratory Program procedures.

Site Geology and Hydrology

The Fried Industries Site is located on the northern part of the Atlantic Coastal Plain of New Jersey. The subsurface strata generally consists of unconsolidated sand, gravel, silt, and clay. The dominant aquifer system in this area is the Potomac-Raritan-Magothy, in which the Farrington Sand is located. The Farrington Sand is the major public water supply aquifer for communities to the southeast.

The Site lies in an outcrop area of the Farrington Sand. The Raritan Fire Clay, underlying the Farrington Sand, acts as an aquitard. The Farrington Sand aquifer outcrop area, at and around the Site (referred to as the shallow aquifer), is utilized by private homeowners for potable water. Also in the vicinity of the Site, the deep Triassic bedrock aquifer, until recently, was used as a source of potable water for private residential wells. Based on data obtained during the RI, ground water in both aquifers was found to flow in a north-northeasterly direction.

More than two-thirds of the Site's acreage is wetlands (Figure 3). A man-made pond, near the entrance to the property, discharges through one of the wetlands areas to a small stream passing east of the building complex. As this stream flows northward from the property's northern terminus, it combines with an unnamed creek that runs along the southwest border of the Site. The combined flow empties into Bog Brook, which, in turn, drains into Lawrence Brook, a tributary of the Raritan River.

Nature and Extent of Contamination

The RI disclosed the presence of significant contamination in the surface soil and ground water, and limited contamination in the stream and swamp sediments. Determining the nature and extent of the Site contamination required a comprehensive effort, including, among other activities, thorough geophysical and soil gas surveys, analysis of existing aerial photographs, geologic and water quality investigations, an aquifer pump test, and a comprehensive sampling program. The RI sampling program, which was conducted in two phases, included approximately 300 surface and subsurface soil samples, 40 monitoring well samples, and about 50 sediment samples, in addition to numerous air, surface water, drum, off-site residential well, and building wipe samples. To obtain subsurface soil and ground-water samples, EPA drilled 17 monitoring wells, installed a pump test well and 6 piezometers, excavated 20 test pits, and drilled 19 soil borings. In addition to EPA activities, the New Jersey Department of Environmental Protection and Energy (NJDEPE) completed a supplemental soil sampling program to determine background levels of arsenic and other metals in undisturbed surface and subsurface soils. The data obtained in this effort was used to calculate the arsenic cleanup level for surface soil in accordance with the NJDEPE's technical requirements and/or proposed cleanup criteria.

The predominant soil contaminants, and their maximum detected concentrations, in parts per million (ppm), are: arsenic (557 ppm), lead (465 ppm), and xylenes (145 ppm). An illustration of the range of concentrations found in the soil is provided in Table 2 and Table 3. The maximum detected concentrations of the principal contaminants found in swamp and stream sediment include: arsenic (199 ppm), beryllium (7.7 ppm), zinc (525 ppm), lead (221 ppm), antimony (118 ppm), and bis(2-ethylhexyl) phthalate (2.9 ppm). The only contaminant of significance in the pond sediment is beryllium, with a maximum detected concentration of 14 ppm. A summary of the range of contamination found in sediment is provided in Table 4. In surface water, contaminants were found in concentrations that were considered not significant (Table 5).

The predominant ground-water contaminants present in the shallow aquifer, and their maximum detected concentrations, include: benzene (6.4 ppm), toluene (280 ppm), total xylenes (49 ppm), 1,1,1-trichloroethane (10 ppm), vinyl chloride (0.55 ppm), ethylbenzene (12 ppm), cis-1,2-dichloroethene (11 ppm), styrene (20 ppm), and trichloroethene (4.2 ppm). The principal groundwater contaminants present in the deep bedrock aquifer include: 1,1-dichloroethane (6.4 ppm), 1,1,1-trichloroethane (22 ppm), trans-1,2-dichloroethene (0.99 ppm), and 1,1-dichloroethane (0.53 ppm). An example of the range of contamination found in ground water is provided in Tables 1-1 and 1-2, and in Figures 8 and 9.

The concentration levels of these and other contaminants, obtained from ground water in both the shallow and deep bedrock aquifers, exceed Federal and/or State drinking water Maximum Contaminant Levels (MCLs) and/or

State Ground-water Quality Standards (Table 6).

The plume of contaminated ground water in the shallow aquifer encompasses the building complex and extends to the north-northeast, and lying entirely within the boundaries of the Fried Industries Site (Figure 4). The estimated dimensions of this plume are: 800 feet long by 400 feet wide by 10 feet deep. Additional deep monitoring wells will be drilled into the bedrock aquifer during the design stage to determine the dimensions of the deep bedrock aquifer contaminant plume.

SUMMARY OF SITE RISKS

Based upon the results of the RI, a baseline risk assessment was conducted to estimate the risks associated with current and future Site conditions. The baseline risk assessment estimates the human health and ecological risk which could result from the contamination at the Site if no remedial action were taken.

The following summarizes the finding of the Risk Assessment. Additional information concerning public health risks is presented in the Risk Assessment section of the Phase II RI report.

Human Health Risk Assessment

The reasonable maximum human exposure is evaluated. A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: Hazard Identification--identifies the contaminants of concern at the Site based on several factors such as toxicity, frequency of occurrence, and concentration. Exposure Assessment--estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed. Toxicity Assessment--determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). Risk Characterization--summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-a-million excess cancer risk) assessment of Site-related risks.

EPA uses a reference dose (RfD) and a slope factor, respectively, to calculate the non-carcinogenic and carcinogenic risk, attributable to a particular contaminant. An RfD is an estimate of a daily exposure level that is not likely to result in any appreciable risk of deleterious effects during a person's lifetime. A slope factor establishes the relationship between the dose of a chemical and the response and is commonly expressed as a probability of a response per unit intake of a chemical over a human lifespan.

To assess the overall potential for carcinogenic effects to arise, EPA calculates excess cancer risk. Excess cancer risk is an estimation of the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the potential carcinogen. Current federal guidelines for acceptable exposure are an excess carcinogenic risk in the range of 10[-4] to 10[-6] (approximately one in ten thousand to one in one million).

The baseline risk assessment began with selecting contaminants of concern (COCs) which would be representative of Site risks (Table 7). The COCs for the Fried Industries Superfund Site were obtained by screening the RI data according to frequency of occurrence, concentration, toxicity, and chemical characteristics. The most significant COCs in the ground water include vinyl chloride, toluene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,1-dichloroethane, benzene, 1,1-dichloroethene, 1,1,1-trichloroethane, total xylenes, ethylbenzene, and phenol. COCs for soil and sediment include arsenic, beryllium, lead, toluene, phenol, and bis(2-ethyl-hexyl)phthalate. Several of the contaminants, including arsenic, vinyl chloride, and benzene, are known to cause cancer in laboratory animals and are suspected of being human carcinogens (Table 8).

The area surrounding the Fried property is zoned for residential use, as evidenced by the presence of homes all around the Site. Back in 1965, the East Brunswick Planning Board re-zoned the Fried property for commercial se, including light industrial use. However, because of the potential for future residential use on the non-wetland portions of the 26-acre property, the more stringent criteria required by a future residential use scenario were incorporated in the risk assessment. Residential use of land implies the use

of ground water; accordingly, the potentiality for use of ground water had to be considered in the risk assessment.

All possible exposure pathways were considered in the risk assessment, including inhalation, ingestion, and absorption of chemicals originating from subsurface and surface soil sources, ground water from both the shallow and deep bedrock aquifers, stream, pond, and marsh sediment, surface water, air, and building surfaces. Table 9 contains a summary of the carcinogenic and non-carcinogenic risks arising from these sources.

Lifetime cancer risks were calculated for exposure pathways in present and future land use scenarios (Tables 10-1 through 10-3 contain Site-specific parameters and assumptions used in the calculation of chronic daily intakes and risks; Table 11 describes the derivation of Site-specific chronic daily intakes). At the present time, there are no people residing on the Site property.

Therefore, exposure pathways were evaluated for Site workers and for adults and children trespassing on the Site property. Under present use conditions, the pathways associated with the greatest carcinogenic risks involved surface soil ingestion, with excess cancer risks of 2.9 x 10[-6] for adult Site workers, and 1.5 x 10[-6] for adult trespassers. This means that nearly three additional adult Site workers out of one million and two additional trespassing adults out of one million could be at increased risk of developing cancer if the surface soil were ingested. Arsenic is the primary contaminant responsible for the excess cancer risks in surface soil. The estimated cancer risks for sediment ingestion in the present use scenario are 1.6 x 10[-6] for trespassing adults, and 1.5 x 10[-6] for trespassing children. Beryllium is the primary COC responsible for the excess cancer risks in the sediment. All four of these estimated cancer risks are well within the EPA guidelines for acceptable exposure (10[-4] to 10[-6]). Present use scenarios were not evaluated for ground-water pathways because, at the present time, there are no pathways of exposure for the consumption of ground water.

Because the potential exists for portions of the Fried property to be developed into a residential area, pathways were examined under a future residential land use scenario. The highest future use risks are associated with surface soil ingestion under a residential use scenario; namely, 3.8 x 10[-6] for resident adults, and 3.0 x 10[-6] for resident children. Arsenic is primarily responsible for these excess cancer risks in the surface soil. Risks from sediment ingestion under the future residential use scenario are 1.6 x 10[-6] for resident adults, and 1.5 x 10[-6] for resident children. Beryllium is the primary COC responsible for these excess cancer risks in the sediment. All four estimates are within the guidelines for acceptable exposure.

In addition to sediment and surface soil pathways, ground-water exposure pathways were evaluated under a future use scenario. Five ground-water exposure pathways exceeded the acceptable cancer risk range of 10[-4] to 10[-6]. For ground water in the shallow aquifer, the estimated cancer risks for ingestion, dermal contact (while showering), and inhalation of volatiles (while showering), by resident adults, are 1.6 x 10[-2] (1.6 in a hundred), 2.0 x 10[-3] (2.0 in a thousand), and 1.3 x 10[-2], respectively. The COCs primarily responsible for these excess cancer risks in the shallow aquifer are vinyl chloride, benzene, and arsenic. Similarly, for deep bedrock aquifer ground water, the estimated cancer risks for ingestion, dermal contact (while showering), and inhalation of volatiles (while showering), by resident adults, are 4.8 x 10[-3], 5.6 x 10[-5] (5.6 in a hundred thousand), and 3.9 x 10[-3], respectively. Vinyl chloride, benzene, and 1,1-dichloroethene are the primary COCs responsible for the excess cancer risks in the deep bedrock aquifer. The results of the baseline risk assessment clearly indicate that ground water, in both the shallow and bedrock aquifers, poses an unacceptable risk to human health and the environment.

To assess the overall potential for non-carcinogenic effects, EPA developed the Hazard Index (HI). This index is calculated by comparing, as a ratio, the exposure level over a specified time period (e.g., lifetime) with a reference dose derived for a similar exposure period. Current federal guidelines for acceptable exposures require HIs not to exceed 1.0.

The baseline risk assessment calculated the potentials for non-carcinogenic effects (HIs) under the same present and future use scenarios as for carcinogenic risks. For non-ground-water pathways under present use conditions, there were no instances where the HI exceeded 1.0. For ground-water pathways, present use

scenarios were not evaluated due to the absence of realistic routes of exposure.

Under the future use scenario, the highest HIs were calculated for resident children and resident adults exposed to contaminated ground water via various pathways; HIs for exposure to surface soil and sediments did not exceed 1.0. For ground water in the shallow aquifer, the maximum His associated with ingestion, dermal contact (while showering), and inhalation of volatiles (while showering), for resident children, are 197, 25.6, and 450, respectively. Similarly, for adult residents, the corresponding His are 98.3, 19.5, and 225. The primary COCs producing these non-carcinogenic risks in the shallow aquifer ground water include toluene, cis-1, 2-dichloroethene, 2-butanone, and 2,4-dimethylphenol. For deep bedrock aquifer ground water, the maximum HIs for ingestion and inhalation of volatiles (while showering) for resident children are 24.0 and 7.6, respectively. Similarly, for adult residents, the corresponding HIs are 12.0 and 3.8. In the deep bedrock aquifer, the COCs responsible for most of the non-carcinogenic risks include 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, trans-1,2-dichloroethene, and 2-methylphenol. As with the carcinogenic risks, evaluation of the potentials for non-carcinogenic effects indicates that the ground water, in both the shallow and bedrock aquifers, poses an unacceptable risk to human health and the environment.

In summary, the baseline risk assessment identified unacceptable carcinogenic and non-carcinogenic risks to human health and the environment from ground water in the shallow and deep bedrock aquifers. In addition to the extraction and on-site treatment of ground water from both aquifers, remediation of the ground water will be expedited and facilitated by excavating the surface and subsurface soil from several locations containing high concentrations of volatile organics (Figure 7) and transporting this material to an appropriate off-site facility for treatment and disposal.

The baseline risk assessment for surface soils evaluated a large data set representing more than 200 surface soil samples collect ed across the entire 26 acre Site. Although the risk assessment indicated that carcinogenic risks were within EPA's acceptable risk range, EPA and NJDEPE have concerns about the elevated concentrations of arsenic at several specific locations (Figure 6) in the surface soil. Essentially all of the carcinogenic risk in the surface soil is due to arsenic, a Class "A" carcinogen. Under the future residential land use scenario, resident children could be exposed to carcinogenic risks exceeding 10[-6] if they play in the areas containing high levels of arsenic in the surface soil. These localized areas have concentrations of arsenic that significantly exceed the concentration used to calculate the risks posed by exposure to arsenic in surface soil. Therefore, EPA and NJDEPE are proposing remediation of these localized areas of elevated arsenic contamination as an appropriate risk management measure. For this purpose, an arsenic cleanup level of 27 ppm was determined using Site-specific arsenic background data (Table 12).

Environmental Risk Assessment

The reasonable maximum environmental exposure is evaluated. A four-step process is utilized for assessing Site-related ecological risks for a reasonable maximum exposure scenario: Problem Formulation - a qualitative evaluation of contaminant release, migration, and fate; identification of contaminants of concern, receptors, exposure pathways, and known ecological effects of the contaminants; and selection of endpoints for further study. Exposure Assessment--a quantitative evaluation of contaminant release, migration, and fate; characterization of exposure pathways and receptors; and measurement or estimation of exposure point concentrations. Ecological Effects Assessment--literature reviews, field studies, and toxicity tests, linking contaminant concentrations to effects on ecological receptors. Risk Characterization--measurement or estimation of both current and future adverse effects. Unlike human health risk assessments, ecological risk assessments focus on the population and ecosystem levels. Because there is a scarcity of toxicity data relevant to wildlife, it is difficult to draw inferences at the population and ecosystems level. Thus, this ecological assessment is largely qualitative.

The ecological risk assessment evaluated the contaminants associated with the Site in conjunction with Site-specific biological species/habitat information. The sediment and surface water COCs fo this assessment include: 1,1-dichloroethane, bis (2-ethyl-hexyl) phthalate, 1,1-dichloroethene, lead, silver, and nickel. Detailed information on the potential ecological effects of the COCs and other Site contaminants is contained in Section 5.8 of the Phase II RI report.

Approximately 70 percent of the Site is comprised of wetlands and associated open water habitats. With the exception of the area in the vicinity of the building complex, the Site contains several different upland and wetlands habitats supporting numerous and diverse wildlife species. Much of the Fried Industries Site was previously disturbed by clay mining operations.

Although the Henslow's sparrow and the wood turtle (state endangered and threatened, respectively) have both been recorded in the vicinity of the Site, no endangered or threatened animal species were recorded on the Fried property. Similarly, no threatened or endangered plant species are known to inhabit the Site, although Swamp pink, a federally listed threatened species, has been found to occur in this area of New Jersey.

The potential impacts of contaminant exposure on local biota were assessed with a review of available criteria and the relevant literature. The primary sources for this information include the Federal Ambient Water Quality Criteria (surface water) and data complied by the National Oceanic and Atmospheric Administration (sediment).

Examination of the combined surface water and sediment data from the RI, and comparison of this data to ecological assessment values cited above, have revealed that organic and inorganic contaminants are present at levels which, potentially, could cause adverse ecological impacts. However, analysis of background soils and Bog Brook background surface water and sediment indicate that contamination is due primarily, if not totally, to regional natural background conditions. An EPA assessment of the macroinvertebrate population present in this segment of the brook indicated that the macroinvertebrates were severely impacted. However, populations of macroinvertebrates present in segments of the brook, located both upgradient (background) and downgradient, were also severely impacted. Given this information, and the fact that only a small portion of the Site drains to the brook, the contamination and resultant impacts on the stream cannot be exclusively related to Site contamination. Furthermore, any minimal benefits which might be derived from remediation of the stream would be shortlived unless the upgradient portion of the stream were remediated in conjunction with the elimination of all upgradient sources contributing to the contamination.

Actual or threatened releases of hazardous substances from this Site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to public health, welfare, or the environment.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources, including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. Unidentified contaminants and tentatively identified compounds (TICs) detected at the Site serve as additional sources of uncertainty. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk Assessment provides

upper-bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available data, standards such as applicable or relevant and appropriate requirements (ARARs), and risk-based levels established in the risk assessment. The following remedial action objectives were established:

- Prevent exposure to areas with arsenic concentrations in surface soils (approximately 900 cy greater than 27 ppm); and

- Restore contaminated ground water, in the shallow and bedrock aquifers, to applicable drinking water standards.

DESCRIPTION OF REMEDIAL ALTERNATIVES

The Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA), requires that each selected site remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The FS report evaluates, in detail, four remedial alternatives for addressing the contamination associated with surface soil (source control), and three remedial alternatives for addressing the ground-water contamination.

These alternatives are:

SOURCE CONTROL ALTERNATIVES

The source control alternatives discussed below were developed to address areas of concentrated arsenic contamination in the surface soil. Accordingly, surface soil remedial alternatives have been developed to effectively reduce the potential for human ingestion of arsenic from areas of high arsenic contamination in the surface soil.

Alternative SC-1: No Action

Estimated Capital Cost:	$ 0
Estimated Annual Operation and Maintenance (O & M) Cost:	$ 0
Estimated 5-Year Review Cost:	$ 20,000
Estimated Present Worth Cost:	$ 43,200
Estimated Construction Time:	None

CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) require the evaluation of a "No Action" alternative to serve as a point of comparison with other remedial action alternatives. The "No Action" alternative for the Fried Industries surface soil consists of leaving the contaminated soil in place. Because this alternative would result in contaminants remaining on the Site above health-based levels, CERCLA requires that the Site be reviewed at least every five years. If justified by the review, remedial actions may be implemented to remove or treat the contaminated soils. No other action is proposed under this alternative.

Alternative SC-2: Limited Action (Institutional Controls)

Estimated Capital Cost: $ 73,400
Estimated Annual O & M Cost: $ 50,800
Estimated 5-Year Review Cost: $ 20,000
Estimated Present Worth Cost: $ 746,600
Estimated Construction Time: Six months

The "Limited Action" alternative would allow the Site to remain in its present condition, as in the "No Action" alternative (SC-1). In addition, this alternative includes monitoring, fence installation, land use restrictions, and a public awareness and education program for the community. Because this alternative would result in contaminants remaining on the Site, CERCLA requires that the Site be reviewed at least every five years.

Alternative SC-3: Excavation/On-Site Treatment/On-Site Disposal

Estimated Capital Cost: $ 561,500
Estimated Annual O & M Cost: $ 0
Estimated 5-Year Review Cost: $ 20,000
Estimated Present Worth Cost: $ 604,600
Estimated Construction Time: One Year

This alternative consists of the excavation of approximately 900 cubic yards of contaminated surface soils, on-site stabilization, and on-site disposal of the stabilized soil.

Surface soil contaminated with arsenic would be excavated and treated in an on-site stabilization plant. Soil disturbance may result in the generation of fugitive dust and volatiles, requiring air monitoring and engineering controls. The excavated soil would be mixed with chemicals and water, resulting in the metals becoming bound within a solid matrix. The treated soil would then be tested to ensure that surface soil cleanup levels are met before redepositing on the Site. The excavated areas would be backfilled with treated soil. An upland area near the Site entrance would be used for the disposal of the additional volume of material resulting from the addition of solidification agents to the soil during the stabilization process. The surface would be graded and provided with a topsoil cover.

In addition, the four underground storage tanks and tank car still remaining on the Site would be investigated during the design phase to determine if the tanks, and any significant associated soil contamination, should be removed. If significant soil contamination is found beneath the main building, and/or in the areas used for staging drums removed during the removal action, the contaminated soil will be removed and treated as part of the remedial action. Additional sampling during the design will determine the need for removal of soil "hot spots" containing zinc, in order to help meet surface water discharge requirements for treated ground water.

Alternative SC-4: Excavation/Off-Site Treatment/Off-Site Disposal

Estimated Capital Cost: $ 652,500
Estimated Annual O & M Cost: $ 0
Estimated 5-Year Review Cost: $ 0
Estimated Present Worth Cost: $ 652,500
Estimated Construction Time: One Year

Like Alternative SC-3, this alternative includes excavating 900 cubic yards of surface soil contaminated with arsenic. The excavated material, however, would be transported to an off-site, Resource Conservation and Recovery Act (RCRA) permitted facility for treatment and ultimate disposal. For costing purposes, it was assumed that the material would be stabilized at the off-site facility. Clean fill would be used to backfill the excavated areas.

Additionally, the four underground storage tanks and tank car still remaining on the Site would be investigated during the design phase to determine if the tanks, and any significant associated soil contamination, should be removed. If significant soil contamination is found beneath the main building,

and/or in the areas used for staging drums removed during the removal action, the contaminated soil will be removed and treated as part of the remedial action. Additional sampling during the design will determine the need for removal of soil "hot spots" containing zinc, in order to help meet surface water discharge requirements for treated ground water.

GROUND-WATER ALTERNATIVES

The ground-water alternatives discussed below were developed to address the inorganic and organic contamination in the shallow (Farrington Sand) and deep (underlying Triassic bedrock) aquifers.

Alternative GW-1: No Action

Estimated Capital Cost: $ 0
Estimated Annual O & M Cost: $ 0
Estimated 5-Year Review Cost: $ 20,000
Estimated Present Worth Cost: $ 43,200
Estimated Construction Time: None

The CERCLA and NCP regulations require the evaluation of a "No Action" alternative to serve as a baseline for comparison with other remedial action alternatives. The "No Action" alternative for the Fried Industries ground-water contamination consists of leaving the ground water undisturbed. Because this alternative would result in leaving contaminants on the Site above health-based levels, CERCLA requires that the Site be reviewed at least every five years. If justified by the review, remedial actions may be implemented to remove or treat the contaminated ground water. No other action is proposed under this alternative.

Alternative GW-2: Limited Action (Institutional Controls)

Estimated Capital Cost: $ 29,700
Estimated Annual O & M Cost: $ 53,900
Estimated 5-Year Review Cost: $ 20,000
Estimated Present Worth Cost: $ 742,100
Estimated Construction Time: Six months

Like the "No Action" alternative (GW-1), the "Limited Action" alternative would allow the ground water to remain undisturbed. In addition, the "Limited Action" alternative includes a public awareness and education program for the community, and water use restrictions. Because this alternative would result in leaving contaminants on the Site, CERCLA requires that the Site be reviewed at least every five years.

Alternative GW-3: Pumping and Treating of Ground Water/Limited Source Extraction

This alternative includes pumping contaminated ground water collected from both the shallow and deep bedrock aquifers to an on-site ground-water treatment system. The treatment system would include chemical precipitation for metals removal, followed by treatment of the organics. The treated ground water would then be discharged to Bog Brook, at a rate of about 10 gallons per minute. The ground water would be treated to meet applicable Federal and State requirements (Table 14). To facilitate the removal of organic contaminants from the ground water via the ground-water treatment system, several areas of concentrated VOCs contamination in the soil, encompassing approximately 2,700 cubic yards (based on the presence of xylenes above 10 ppm and chloroform above 1 ppm), would be removed and transported to an appropriate off-site facility for treatment and/or disposal. Approximately 400 cubic yards of the VOC-contaminated soil is also part of the soil volume contaminated with arsenic at concentrations requiring remediation. This 400 cubic yards of soil would be subject to off-site treatment and disposal in accordance with RCRA and other waste disposal regulations. Clean fill would be used to backfill the excavated areas.

Additional sampling during the design will determine the need for removal of ground-water "hot spots" containing zinc, in order to help meet surface water discharge requirements for treated ground water.

Two different technologies for the treatment of organic contaminants in ground water are presented in the following two options.

Option 1: Precipitation, Activated Carbon, and Discharge to Surface Water

Estimated Capital Cost:	$ 4,348,000
Estimated Annual O & M Cost:	$ 476,500
Estimated 5-Year Review Cost:	$ 20,000
Estimated Present Worth Cost:	$ 10,304,400
Estimated Construction Time:	One Year
Estimated Completion Time:	30 Years

Ground water, pre-treated for metals removal, would pass through a carbon adsorption system, including multiple carbon units, for removal of the organic contaminants. The treated effluent would be discharged to Bog Brook (Table 14). The ground-water treatment system would be monitored to assure proper operation and confirm that surface discharge requirements are being met. For costing purposes, the length of time to complete the ground-water phase of the remedial action was estimated to be 30 years. The actual time required would be determined during the remedial design. The sludge and spent activated carbon would be properly disposed of at an off-site facility in accordance with Federal and State regulations.

Option 2: Precipitation, Air Stripping/Activated Carbon, and Discharge to Surface Water

Estimated Capital Cost:	$ 4,440,600
Estimated Annual O & M Cost:	$ 599,800
Estimated 5-Year Review Cost:	$ 20,000
Estimated Present Worth Cost:	$ 11,926,500
Estimated Construction Time:	One Year
Estimated Completion Time:	30 Years

Option 2 is similar to Option 1, except that the organic contaminants would be removed via an air stripper, followed by an activated carbon unit. In addition to off-site disposal of the resulting sludge and spent carbon, the air stripper off-gas would be treated prior to being vented to the atmosphere.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the NCP, a detailed analysis of each remedial alternative was conducted with respect to each of the nine criteria described below.This section discusses and compares the performance of the remedial alternatives considered against these criteria. All selected alternatives must at least attain the Threshold Criteria. The selected alternative should provide the best balance among the nine criteria. The Modifying Criteria were evaluated following the public comment period. These nine criteria were developed to address the requirements of Section 121 of CERCLA to ensure all important considerations are factored into remedy selection decisions.

Threshold Criteria

1. Overall Protection of Human Health and the Environment addresses whether or not an alternative provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with Applicable and Relevant and Appropriate Requirements (ARARs) addresses whether or not an alternative will meet all of the ARARs of the Federal and State environmental statutes or provide a basis for invoking a waiver.

Primary Balancing Criteria

3. Long-term Effectiveness and Permanence refers to the magnitude of residual risk and the ability of an alternative to maintain reliable protection of human health and the environment over time once remedial objectives have been met.

4. Reduction of Toxicity, Mobility, or Volume addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as a principal element.

5. Short-term Effectiveness refers to the period of time that is needed to achieve protection, as well as the alternative's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

6. Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular alternative.

7. Cost includes estimated capital and operation and maintenance costs, and the present worth costs.

Modifying Criteria

8. State acceptance indicates whether, based on its review of the RI and FS reports and the Proposed Plan, the State supports, opposes, and/or has identified any reservations with the preferred alternative.

9. Community acceptance refers to the public's general response to the alternatives described in the Proposed Plan and the RI and FS reports. Responses to public comments are addressed in the Responsiveness Summary of this Record of Decision.

A comparative analysis of these alternatives, based upon the evaluation criteria noted above, is presented below.

Overall Protection of Human Health and the Environment

In evaluating the source control (surface soil) alternatives, the "No Action" (SC-1) and "Limited Action" (SC-2) alternatives do not offer adequate protection of human health because of the levels of arsenic that would remain untreated in the surface soils under a future residential use scenario. Alternatives SC-1 and SC-2 would not reduce the human health hazards associated with surface soil ingestion of arsenic, although SC-2 would slightly reduce the likelihood of exposure. Alternative SC-3 would offer adequate overall protection by immobilizing arsenic and other metals in a solid matrix disposed of on the Site. Alternative SC-4, by removing the contaminated surface soil for off-site treatment and disposal, would also offer adequate protection.

In evaluating the ground-water alternatives, the "No Action" (GW-1) and "Limited Action" (GW-2) alternatives

offer some protection of human health, but do not offer adequate protection of the environment because high levels of organics and inorganics would remain in the ground water. Furthermore, the institutional controls in Alternative GW-2 would provide some public health protection through use restrictions and limited Site access. The active remediation described in Alternative GW-3, however, would attempt to restore the contaminated ground water to Federal and State MCLs and New Jersey Ground-water Quality Standards, and would provide better overall protection of human health and the environment.

Compliance with ARARs

In evaluating the source control (surface soil) alternatives, the "No Action" (SC-1) and "Limited Action" (SC-2) alternatives would meet location-specific ARARs, as would active Alternatives SC-3 and SC-4. Based upon metals contents and leachability characteristics of the soils, it is anticipated that Alternative SC-3 would comply with the RCRA Land Disposal Restrictions (LDRs). If the selected treatment technology cannot meet the LDR standards for characteristic wastes, a treatability variance may berequired.

Up to six acres of wetlands may be disturbed during implementation of the selected remedy. Appropriate remedial measures to protect or restore such wetland areas will be determined during the Remedial Design. Due to the proximity of surface water bodies and wetlands, waivers may be needed for some location-specific ARARs such as the State's transition area rules to conduct remedial activities under Alternatives SC-3 and SC-4; the need for such ARAR waivers would be determined during the remedial design stage. Alternative SC-4 would comply with all ARARs for transport, treatment, and disposal of the contaminated soil. All activities would be conducted in accordance with action-specific ARARs.

Contaminant levels in the ground water are above established Federal and State MCLs and State Ground-water Quality Standards, and calculations indicate that there would not be any appreciable attenuation over time. Therefore, implementing the "No Action" and "Limited Action" ground-water alternatives GW-1 and GW-2) would not meet ARARs in a reasonable amount of time. For Alternative GW-3, the extraction and treatment of the shallow and bedrock aquifer ground water would continue until chemical-specific ARARs are met. The treated ground-water discharge stream would also be monitored for compliance with discharge to surface water ARARs. Should any effluent limitation for discharge to Bog Brook (which is an intermittent stream) not be technically achievable within the range of the treatment system identified in the Feasibility Study and the ROD, EPA, in conjunction with NJDEPE, may either relocate the treated ground-water discharge to Lawrence Brook (which is a continuous flowing stream) to meet that limitation, or waive the effluent limitation for Bog Brook.

Since the Fried Industries Site is largely wetlands, ground-water treatment facilities (Alternative GW-3) would be erected in the large upland area near the entrance to the Site. It would be necessary to waive location-specific ARARs because the treatment facilities would be located within a wetlands transition area as defined by New Jersey Transition Area Rules.

Several action-specific ARARs also address the conduct of remedial actions around wetland areas. Since much of the Site is either wetland or open water, an ARAR waiver may be necessary because it is technically impracticable to implement the remedy when there is inadequate room for treatment units and auxiliary equipment. Impacted wetland areas are expected to be minimal; however, those wetland areas that are impacted will be restored in accordance with federal and State requirements.

Long-Term Effectiveness and Permanence

The "No Action" and "Limited Action" alternatives (SC-1, SC-2, GW-1, and GW-2) would not provide an acceptable reduction in risk in the surface soil and ground water. Each of these alternatives would result in hazardous substances remaining on the Site; this would require that EPA review the Site at least every five years.

Both Alternative SC-3 and Alternative SC-4 would remediate the surface soil for arsenic and other metals. However, Alternative SC-3 would require long-term monitoring to ensure the integrity of the on-site stabilized material. Therefore, off-site stabilization and disposal (SC-4) would provide superior long-term effectiveness and permanence.

Alternative GW-3 would be consistent with the long-term effectiveness goals for the Site by treating the ground water until MCLs are achieved, or until it is demonstrated that it is technically infeasible to attain remediation goals.

Reduction in Toxicity, Mobility, or Volume

The "No Action" and "Limited Action" alternatives (SC-1, SC-2, GW-1, and GW-2) do not achieve any significant reduction in the toxicity of the contaminated soils and ground water. Migration of contaminants in soil and in ground water would continue, and, due to this mobility, the volumes of contaminated soil and ground water would increase with time.

Alternative SC-3 would achieve effective reduction in mobility of arsenic through stabilization. However, stabilization results in an increase in the volume of contaminated material through the addition of solidifying reagents. Although the toxicity actually remains the same, the solidified matrix makes it inaccessible.

In Alternative SC-4, arsenic would be immobilized at an off-site facility, and disposed of at an off-site landfill. Hence, Alternative SC-4 would be effective at reducing the mobility of arsenic contaminated surface soils; as in Alternative SC-3, the toxicity of the material would not be reduced through stabilization.

Alternative GW-3 is effective in reducing the toxicity, mobility, and volume of ground-water contaminants by removing both organic and inorganic contaminants via treatment.

Short-Term Effectiveness

The "No Action" and "Limited Action" alternatives (SC-1, SC-2, GW-1, and GW-2) would have no significant short-term impacts. The soil treatment alternatives (SC-3 and SC-4) involve disturbing the soil, which would generate fugitive dust and volatiles from Site operations. However, these concerns could be effectively addressed through air monitoring and engineering controls.

Both soil treatment alternatives would require the implementation of a health and safety plan to minimize any risks to on-site workers and nearby residents. The amount of time until protectiveness is achieved could increase substantially for SC-3 if an off-site staging area is required for implementation (see discussion below). The time to reach protectiveness for Alternatives SC-3 and SC-4 is estimated to be one year.

The installation of extraction wells and the collection system in Alternative GW-3 also involves some soil disturbance, generating fugitive dust and possibly volatiles from drilling and excavation operations. Air monitoring and engineering controls may be necessary to reduce airborne dust and emissions. A health and safety plan would be required to minimize any risks to on-site workers and nearby residents from well installation and trench construction operations. The time to reach protectiveness for Alternative GW-3 is estimated to be 30 years.

Implementability

There are no problems implementing the "No Action" alternatives (SC-1 and GW-1) because they would only involve five-year reviews. The "Limited Action" alternatives (SC-2 and GW-2) are also easily implementable, involving only five-year reviews, monitoring, land use restrictions, and fence installation (SC-2).

Alternative SC-3 would be easily implemented from a technology standpoint. However, Alternative SC-3 may require nearby areas for the staging of equipment and materials handling, due to the extensive on-site wetlands; therefore, Alternative SC-3 may not be easy to implement logistically. The off-site stabilization alternative (SC-4) uses the same proven technology, but would be easier than Alternative SC-3 to implement because the excavated soils would be treated and disposed of at off-site facilities, obviating the need for additional staging areas near the Site. Aside from the obvious impacts caused by the excavation of contaminated soils from wetland areas, and the disturbances arising from the installation of piping and related equipment for the extraction wells and collection trench, there shouldn't be any additional

disruptions to the wetlands areas.

The treatment steps in ground-water Alternative GW-3 include conventional wastewater treatment processes that have been used extensively to treat contaminated ground water. The technology is well-developed and commercially available. Although considerable institutional management is necessary to ensure proper operation, maintenance, and compliance with various regulations and requirements, these should not pose any unusual difficulties.

A common implementation problem encountered during remediation of Superfund sites is the need for an on-site staging area. Any planned ground-water and/or soil remediation activities will require staging areas for materials, equipment, decontamination, and support services. The limited availability of a staging area due to the presence of extensive wetlands at the Site, as well as safety reasons, will likely require that the building complex be demolished.

Cost

Estimated present worth costs for stabilization of surface soils are $604,600 for Alternative SC-3 (on-site stabilization/disposal) and $652,500 for Alternative SC-4 (off-site stabilization/disposal). Due to the minor cost differences between the two alternatives, and the more difficult implementability of Alternative SC-3, Alternative SC-4 is considered to be the most cost-effective alternative that would be protective of human health and the environment.

The estimated present worth of the treatment options in Alternative GW-3 is $10,304,400 for Option 1 (activated carbon system) and $11,926,500 for Option 2 (air stripping/activated carbon). Alternative GW-3, Option 1, is the most cost-effective groundwater alternative that would be protective of human health and the environment.

State Acceptance

The State of New Jersey supports the selected remedy presented in this Record of Decision.

Community Acceptance

Community acceptance was evaluated after the close of the public comment period. Written comments received during the public comment period, as well as verbal comments during the public meeting on September 21, 1993, were evaluated. The responses to these comments are addressed in the Responsiveness Summary.

Comments received during the public comment period indicated that the local residents were mostly satisfied with the preferred alternatives for the soil and ground water.

SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives using the nine criteria, and public comments, EPA and NJDEPE have determined that Alternative SC-4 (Excavation/Off-Site Treatment/Off-Site Disposal), and Alternative GW-3 Option 1 (Pumping and Treating of Ground Water/Limited Source Extraction) is the most appropriate remedy for the Fried Industries Site.

The major components of the selected remedy include the following:

For surface soils:

- Excavation of about 900 cubic yards from areas of elevated arsenic contamination in the surface soil (Figure 6), off-site stabilization, and off-site disposal of the stabilized surface soil. Treatment residuals will be disposed of, at an appropriate off-site facility, in accordance with CERCLA requirements. During design, if significant soil contamination is found in the vicinity of the underground storage

tanks and tank car, in the areas that were used for staging drums, and/or beneath the main building, the contaminated soils will be removed and treated as part of the remedial action. Additional sampling during the design will determine the need for removal of soil "hot spots" containing zinc, in order to help meet surface water discharge requirements for treated ground water.

For ground water:

On-site ground-water extraction from the bedrock aquifer: collection of ground water from the shallow aquifer; combined ground-water flow is subject to metals pretreatment by precipitation, organics treatment by activated carbon system, and discharge to Bog Brook. In addition, excavation of approximately 2,700 cubic yards from areas of concentrated VOCs contamination in the soil (Figure 7), with appropriate off-site treatment and disposal (this includes treatment and disposal of 400 cubic yards of soil contaminated with both VOCs and arsenic). Additional sampling during the design will determine the need for removal of ground-water "hot spots" containing zinc, in order to help meet surface water discharge requirements for treated ground water.

Residual wastes such as precipitates and spent carbon will be transported to an appropriate off-site facility for disposal in accordance with RCRA and CERCLA requirements.

The goal of the ground-water portion of the remedial action is to restore the ground water to its beneficial use, in this case, a potential source of drinking water. Vinyl chloride, benzene, toluene, and other contaminants present in the two aquifers will be extracted/collected and treated until concentrations in these aquifers are reduced to levels below the most stringent of the Federal MCLs, New Jersey MCLs, or New Jersey Ground-water Quality Standards. In addition, the effluent from the treatment process will achieve Federal and State surface water quality discharge standards (Table 14).

EPA recognizes that the selected remedy may not achieve this aquifer restoration goal because of the technical difficulties associated with achieving ground-water cleanup levels. It may become apparent, during implementation or operation of the ground-water extraction/collection and treatment system that contaminant levels have ceased to decline and are remaining constant at levels higher than the remediation goals (Table 6) for ground-water cleanup levels. In such a case, the system's performance standards, and/or the remedy, may be reevaluated. Performance monitoring of the ground-water extraction/collection and treatment system will be implemented. The data collected will be used to suggest system adjustments or modifications to provide more effective or efficient attainment of cleanup levels. Such adjustments or modifications may include: increasing or decreasing the extraction rate, initiating a pulsed pumping schedule, installing additional extraction wells, or ceasing extraction at wells where cleanup levels have been achieved. Monitoring data will be used to assess the effectiveness of the modifications implemented and may be used to re-assess the time frame required to achieve cleanup levels. In addition, contamination in surface water and in sediments will be monitored to insure there are no risks generated by these media.

The levels of volatile organic contamination in the soils, in this case, do not pose unacceptable carcinogenic or non-carcinogenic risks. However, several areas of concentrated volatile organic contamination in the soil represent continuing sources of high ground-water contamination. In order to facilitate the removal of VOCs from the ground water, approximately 2,700 cubic yards of contaminated soil will be removed from these areas (Figure 7) and transported to an appropriate off-site facility for treatment and disposal. The combined areas to be excavated, including both arsenic-contaminated soils and VOCs-contaminated soils, are represented in Figure 5.

EPA and NJDEPE have agreed that a site-specific arsenic cleanup level of 27 ppm, statistically derived from Site background data, will be used for surface soil remediation (Table 12), because of the high background arsenic concentrations found at the Site.

The estimated present worth cost of off-site stabilization of surface soils (Alternative SC-4) is $652,500. Due to the minor cost differences between the two stabilization alternatives (SC-3 and SC-4), and the more difficult implementability of Alternative SC-3, Alternative SC-4 is considered to be the most cost effective alternative that would be protective of human health and the environment. The estimated present worth cost of on-site treatment of ground water (Alternative GW-3 Option 1) is $10,304,400. Option 1 (activated carbon system) was chosen in lieu of Option 2 (air stripping/activated carbon) because Option 1 is the most cost-effective of the alternatives that would be protective of human health and the environment. An analysis of the present worth costs of the selected remedy (Source Control Alternative SC-4 and Ground-water Alternative GW-3 Option 1), including capital costs and operation and maintenance costs, are presented in Tables 13-1 and 13-2.

STATUTORY DETERMINATIONS

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete, the selected remedial action for the Fried Site must comply with applicable, or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is justified. The selected remedy also must be cost effective and utilize permanent solutions and alternative treatment technologies or resource-recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment, as it effectively addresses the principal threats posed by the Site, namely: the arsenic-contaminated surface soils and the VOCs-contaminated ground water in the surface and deep bedrock aquifers.

The arsenic in the surface soil, the contaminant of concern that is responsible for almost all of the carcinogenic risk in surface soil ingestion, will be excavated down to 27 ppm, a level representing an ingestion exposure risk of 2.1 x 10[-5] for carcinogens, an HI less than 1.0 for non-carcinogenic effects, and the background concentration for arsenic in the area. Excavation and off-site stabilization of arsenic-contaminated surface soil will protect against future ingestion hazards. Additionally, the removal of the contaminated soil from the Site will reduce infiltration of arsenic into the ground water.

Capturing and treating contaminated ground water from the shallow and deep bedrock aquifers will protect against future ingestion, and direct contact and inhalation hazards while showering. The contaminants in the ground water will be reduced to levels that are acceptable for drinking water, thereby protecting human health.

Sampling data indicated the building complex presented no significant risk from contamination. The buildings and other structures in and around the building complex are in poor condition, constituting a safety hazard to Site workers as well as creating an impediment to equipment operation. To ensure the safety of these Site workers, and to facilitate heavy equipment operations in implementing the selected remedy, the building complex will be demolished to eliminate the physical hazards associated with these unsafe structures.

Compliance with Applicable or Relevant and Appropriate Requirements

Attainment of chemical-specific ARARs for the aquifer will be achieved via the extraction/collection and treatment of ground water. As previously discussed, should any effluent limitation for discharge to Bog Brook (which is an intermittent stream) not be technically achievable within the range of the treatment system identified in the Feasibility Study and the ROD, EPA, in conjunction with NJDEPE, may either relocate the treated groundwater discharge to Lawrence Brook (which is a continuous flowing stream) to meet that limitation, or waive the effluent limitation for Bog Brook.

Action-specific and location-specific ARARs will be complied with during implementation of the remedy. The specific ARARs for the selected remedy are listed below.

Chemical-specific ARARs:

- Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs): (40 CFR Part 141)
- Clean Water Act Water Quality Criteria (WQC): (40 CFR Part 131)
- RCRA Maximum Concentration Limits (MCLs): (40 CFR 264)
- RCRA Land Disposal Restrictions: (40 CFR 268)
- New Jersey Safe Drinking Water Act MCLs: (NJAC: 7:10-16)
- New Jersey Water Pollution Control Act Standards for Ground Water: (NJAC: 7:9-6)
- New Jersey Water Pollution Discharge Elimination System: (NJAC: 7:14A)
- New Jersey Surface Water Quality Standards: (NJAC 7:9-4.1)

Location-specific ARARs:

- Clean Water Act, Section 404: (33 USC 466)
- Executive Orders on Floodplain Management and Protection of Wetlands: (E.O. 11988, 11990)
- EPA/COE Memorandum of Agreement on Wetlands Protection
- Fish and Wildlife Coordination Act: (16 USC 661)
- Endangered Species Act: (16 USC 1531)
- National Historic Preservation Act: (16 USC 470)
- New Jersey Flood Hazard Area Control Act: (NJSA 58:6A-50)
- New Jersey Freshwater Wetlands Protection Act: (NJSA 13:9B-1)
- New Jersey Freshwater Wetlands Transition Area Rules: (NJAC 7:7)
- New Jersey Freshwater Wetlands Protection Rules: (NJAC 7:7A)
- New Jersey Stream Encroachment Regulations: (NJAC 7:13-1.1)

Action-specific ARARs:

- Clean Water Act Water Quality Criteria (WQC): (40 CFR Part 131)
- RCRA Land Disposal Restrictions: (40 CFR 268)
- Clean Air Act National Ambient Air Quality Standards: (40 CFR Part 50)
- OSHA General Industry Standards: (29 CFR 1910)
- OSHA Safety and Health Standards: (29 CFR 1926)

- OSHA Record Keeping, Reporting, and Related Regulations: (29 CFR 1904)
- RCRA Standards for Generators of Hazardous Waste: (40 CFR 262.1)
- RCRA Standards for Transporters of Hazardous Waste: (40 CFR 263.11, 263.20-21, and 263.30-31)
- RCRA Standards for Owners/Operators of Permitted Hazardous Waste Facilities: (40 CFR 264.10-264.18)
- RCRA - Preparedness and Prevention: (40 CFR 264.30-31)
- RCRA - Contingency Plan and Emergency Procedures: (40 CFR 264.50-264.56)
- RCRA - Ground-water Protection: (40 CFR 264.90-264.109)
- RCRA - Standards for Excavation and Fugitive Dust: (40 CFR 264.251-264.254)
- RCRA - Miscellaneous Units: (40 CFR 264.600-264.999)
- RCRA - Closure and Post-Closure (40 CFR 264.110-264.120)
- DOT Rules for Transportation of Hazardous Materials: (49 CFR 107, 171.1-172.558)
- New Jersey Hazardous Waste Manifest System Rules: (NJAC 7:26)
- New Jersey Hazardous Waste Treatment Storage and Disposal Facility Permitting Requirements: (NJAC 7:26)
- New Jersey Water Pollution Discharge Elimination System: (NJAC: 7:14A)
- New Jersey Surface Water Quality Standards: (NJAC 7:9-4.1)
- New Jersey Clean Air Act: (NJSA 26:2C)
- New Jersey Air Pollution Control Act: (NJAC 7:27-5, 13, 16, and 17)

Cost-Effectiveness

Of the alternatives which most effectively address the threats posed by Site contamination, the selected remedy provides for overall effectiveness in proportion to its cost. The estimated total project cost, including both the selected surface soil and ground-water alternatives, is $10,956,900 (derived from Tables 13-1 and 13-2).

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

Contaminants in the ground water will be removed and treated before discharging to surface water. Hazardous wastes generated by the treatment process will be disposed of at an approved off-site facility. This will significantly reduce the toxicity, mobility and volume of the contaminants, and offer a permanent solution to the risks posed by the contaminated ground water.

Off-site stabilization of soil contaminated with arsenic in excess of 27 ppm will reduce the mobility of this contaminant and, therefore, represents a permanent solution to the risks posed by the contaminated surface soil at the Site. Although the toxicity and volume of the contaminated soil will not be reduced at the actual treatment facility, the selected remedy represents the maximum extent to which the toxicity, mobility, and volume can be reduced at the Site in a cost-effective manner.

Preference for Treatment as a Principal Element

The selected ground-water remedy satisfies the preference for treatment as a principal element. The on-site contaminated ground water will be extracted/collected and treated, using precipitation for metals and carbon adsorption for VOCs, to reduce the levels of contaminants, thereby reducing the risk to human health. The excavation and off-site treatment/disposal of VOCs-contaminated soil was included for the purpose of facilitating the pump and treat process; the treatment of soils highly contaminated with VOCs will also serve to further reduce any potential threat to human health.

The statutory preference for remedies that employ treatment as a principal element will also be satisfied for the arsenic-contaminated soil. The arsenic-contaminated soil will be transported for treatment and disposal at appropriate off-site facilities, thereby reducing the risk to human health.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Site was released to the public on September 9, 1993. The Proposed Plan identified the preferred alternatives for ground-water and soil remediation. EPA reviewed all written and verbal comments received during the public comment period. Upon review of these comments, EPA determined that no significant changes to the selected remedy, as it was originally identified in the Proposed Plan, were necessary.

However, after the Proposed Plan became final in October, 1993, several minor revisions to the remedy became necessary. Additional sampling will be included during the design, to determine if there is significant soil contamination in the areas used to stage drums and/or beneath the main building. Samples may also be taken to identify soil and ground-water "hot spots". The contaminated soil and ground water would be removed and treated as part of the remedial action. Additional expenses that might result from the above activities have not been included in the cost of the remedy. Similarly, costs resulting from the possible cleanup of the underground tanks and tank car contamination were also not included in the cost of the remedy.

APPENDIX I

FIGURES

Figure #	Identification
1	General Location Map
2	Fried Industries Site Map
3	Wetlands Areas on the Fried Property
4	Extent of Ground-water Contamination Plume
5	Areas to be Excavated
6	Arsenic Contamination in Surface Soil
7	VOCs Contamination in Soil
8	Ground-water Contamination (Phase I RI)
9	Ground-water Contamination (Phase II RI)

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APPENDIX II

TABLES

Table #	Identification
1	Ground Water Data (Phase I and II RI): 2 Tables
2	Surface Soil Data (Phase I and II RI)
3	Subsurface Soil Data (Phase I and II RI)
4	Sediment Data (Phase I and II RI)
5	Surface Water Data (Phase I and II RI)
6	Federal/State Maximum Contaminant Levels
7	Contaminants-of-Concern
8	Toxicity Data (RfDs, Slope Factors, etc.)
9	Summary of Risks
10	Exposure Parameters/Assumptions: 3 Tables
11	Calculation of Chronic Daily Intakes
12	Derivation of Arsenic Cleanup Level
13	Capital and Operation/Maintenance Costs of Selected Remedy: 2 Tables
14	Treatment Plant Discharge Requirements

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TABLE 11
CALCULATIONS USED TO DERIVE
CHRONIC DAILY INTAKES (CDIs)
INGESTION OF GROUNDWATER

Carcinogens:

$$CDI = WC(mg/l) \times DI(L/day) \times \frac{\%\ Bioavail.}{BW\ (kg)} \times \frac{\#\ Events}{365\ days} \times \frac{Years\ Exp.}{75\ years}$$

Noncarcinogens:

$$CDI = WC(mg/L) \times DI(L/day) \times \frac{Bioavail.}{BW\ (kg)} \times \frac{\#Events}{365\ days}$$

INHALATION OF VOLATILES IN GROUNDWATER

Carcinogens:

$$CDI = AC\ (mg/m[3]) \times Bioavail.(100\%) \times \frac{IR\ (m[3]/event)}{BW\ (kg)} \times \frac{\#Events}{365\ days} \times \frac{Years\ Exp.}{75\ years}$$

Noncarcinogens:

$$CDI = AC\ (mg/m[3]) \times Bioavail. \times \frac{IR\ (m[3]/event)}{BW\ (kg)} \times \frac{\#\ Events}{365\ days}$$

DIRECT CONTACT WITH GROUNDWATER

Carcinogens:

$$CDI = WC\ (mg/L) \times \frac{SSA\ (cm2)}{BW\ (kg)} \times DP\ (cm/hr) \times \frac{1\ Liter}{1000\ cm[3]Event} \times \frac{Hours}{Event} \times \frac{\#Events}{365\ days} \times \frac{Years\ Exp.}{75\ years}$$

Noncarcinogens:

$$CDI = WC\ (mg/L) \times \frac{SSA(cm[2])}{BW\ (kg)} \times DP\ (cm/hr) \times \frac{1\ Liter}{1000\ cm[3]Event} \times \frac{Hours}{Event} \times \frac{\#\ Events}{365\ days}$$

DEFINITIONS:

CDI	=	Chronic Daily Intake (mg/kg-day)
WC	=	Water Concentration (mg/L)
BW	=	Body Weight (kg)
75	=	Years in Average Adult Lifetime
DP	=	Dermal Permeability constant (cm/hr)
SSA	=	Skin Surface Area (cm[2])
DI	=	Daily Ingestion Rate (L/day)
IR	=	Inhalation Rate (m[3]/event)
Bioavail.	=	Bioavailability Factor
AC	=	Air Concentration (volatiles) (mg/m[3])

TABLE 12

CALCULATION OF ARSENIC CLEANUP LEVEL
AT FRIED INDUSTRIES SUPERFUND SITE

A statistical analysis of the data from twenty-three (23) samples, obtained during the background data survey by the New Jersey Department of Environmental Protection and Energy (NJDEPE), was performed by EPA. The results were as follows:

$$(1)\quad \bar{XA}\ (\text{arithmetic mean}) = (1/n) \sum_{i=1}^{n} xi = \frac{172.33}{23}$$

$$\bar{XA}\ (\text{arithmetic mean}) = 7.49$$

$$(2)\quad (\text{standard deviation}) = (1/n) \sum_{i=1}^{n} xi\,[2] - (\bar{x}[2])$$

$$(\text{standard deviation}) = 9.60$$

(3) We will use the arsenic concentration corresponding to the arithmetic mean plus two times the standard deviation:

$$\text{ARSENIC CLEANUP LEVEL} = \bar{X} + 2$$

$$\text{A.C.L.} = 7.49 + (2 \times 9.60)$$

$$\text{A.C.L.} = 7.49 + 19.20$$

$$\text{A.C.L.} = 26.69$$

ARSENIC CLEANUP LEVEL = 27 PPM

TABLE 13-1

CAPITAL COST ESTIMATES (1993 Dollars)

ALTERNATIVE SC-4: Excavation/Off-Site Treatment/Off-Site Disposal

I.	Site Preparation		$ 56,400
II.	Support Facilities		71,500
III.	Clearing and Grubbing		1,500
IV.	Contaminated Soil Excavation		10,400
V.	Sheet Piling		30,000
VI.	Transportation	(included in Item VIII)	
VII.	Pretreatment	(included in Item VIII)	
VIII.	Off-Site Stabilization		273,000
IX.	Stabilized Soil Disposa	(included in Item VIII)	
X.	Clean Fill		36,000
XI.	Restoration of Wetlands		4,100
	Total Direct Construction Costs (TDCC)	=	$ 483,300
	Contingency @ 20% of TDCC	=	96,700
	Engineering @ 10% of TDCC	=	48,300
	Legal and Administrative @ 5% of TDCC	=	24,200
	TOTAL CONSTRUCTION COST	=	$ 652,500

ALTERNATIVE GW-3: Pumping and Treating of Groundwater/Limited Source Extraction (Option 1)

I.	Site Preparation	(included in Source Control)	
II.	Support Facilities	(included in Source Control)	
III.	Groundwater Monitoring Wells		$ 36,000
IV.	Groundwater Interception Trench		35,000
V.	Groundwater Extraction		226,000
VI.	Collection		21,500
VII.	Chemical Precipitation System		71,600
VIII.	Filtration System		64,300
IX.	Sludge Handling System		31,000
X.	Air Stripper/Carbon		32,600
XI.	Treated Water Disposal		82,000
XII.	Source Control		2,292,800
	(includes $ 2,160,000 for incineration)		
XIII.	Office and Control Building		52,500
XIV.	Electrical		100,000
XV.	Instrumentation and Controls		60,000
XVI.	Process Water Supply		3,000
XVII.	Foundation and Pads		12,500
XVIII.	Health and Safety		50,000
XIX.	Mobilization/Demobilization		50,000
	Total Direct Construction Cost (TDCC)	= $	3,220,800
	Contingency @ 20% of TDCC	=	644,200
	Engineering @ 10% of TDCC	=	322,000
	Legal and Administrative @ 5% of TDCC	=	161,000
	TOTAL CONSTRUCTION COST	= $	4,348,000

TABLE 13-2

ANNUAL OPERATION AND MAINTENANCE COST ESTIMATES (1983 Dollars)

ALTERNATIVE SC-4: Excavation/Off-Site Treatment/Off-Site Disposal

This Alternative does not require Operation and Maintenance

ALTERNATIVE GW-3: Pumping and Treating of Groundwater/Limited Source Extraction (Option 1)

I.	Extraction		$ 1,000
II.	Collection		1,300
III.	Chemical Precipitation System		1,000
IV.	Sludge Handling System		1,700
V.	Filtration System		23,500
VI.	Activated Carbon Treatment System		200,700
VII.	Labor		116,800
VIII.	Maintenance Cost		74,200
IX.	Monitoring		33,600
X.	Contingency		22,700
Total Annual O & M Cost		=	$ 476,500
PRESENT WORTH OF O & M (7% discount rate)		=	$ 5,956,400

TABLE 14

DISCHARGE REQUIREMENTS

PARAMETER	MAXIMUM VALUE IN GROUNDWATER[1]	NJDEPE EFFLUENT LIMITS (monthly average)	(daily maximum)
CONVENTIONAL/NON-CONVENTIONAL POLLUTANTS			
Flow (mgd)	0.014 (10 gal/min)	0.014 (10 gal/min)	Report
BOD5 (mg/l)	330	Report[2]	25
Chloride (mg/l)	207	Report	250
Dissolved Oxygen (mg/l)	—	5.0 minimum	---
pH (std. units)	—	6.0 minimum	9.0
Petroleum Hydrocarbons (mg/l)	—	10	15
Total Dissolved Solids (mg/l)	925	Report	500
Total Organic Carbon (mg/l)	323	Report	50
Total Suspended Solids (mg/l)	666	Report	40
Chronic Toxicity (% effluent)	—	NOEC 100%[3]	NOEC 100%[3]
VOLATILE COMPOUNDS (in g/l)			
Acetone	1200	50	100
Benzene	6400	1.2	2.4
2-Butanone	320	16	32
Chloroethane	1400	Controlled with 1,1-Dichloroethane	
Chloroform	21	5.7	11
1,1-Dichloroethane	6400	16	32
1,2-Dichloroethane	50	0.38	0.76
1,1-Dichloroethylene	530	0.57	1.1

TABLE 14 (continued)

PARAMETER	MAXIMUM VALUE IN GROUNDWATER(1)	NJDEPE EFFLUENT LIMITS (monthly average)	(daily maximum)
trans-1,2-Dichloroethylene	990	21	54
1,2-Dichloropropane	165	Controlled with 1,1-Dichloroethane	
Ethylbenzene	12000	32	108
Methylene Chloride	2000	4.7	9.4
4-Methyl-2-Pentanone	130	13	26
Styrene	20000	Controlled with Benzene	
Toluene	280000	26	80
1,1,1-Trichloroethane	22000	11	22
1,1,2-Trichloroethane	18	6.0	12
Trichloroethylene	4200	2.7	5.4
Vinyl Chloride	550	2.0	4.0
Xylenes, Total	49000	Controlled with Benzene	
ACID AND BASE/NEUTRAL COMPOUNDS (in g/l)			
Di-n-Butylphthalate	22	Report	10
2,4-Dimethylphenol	3550	Controlled with Phenol	
bis(2-Ethylhexyl)-Phthalate	10	Report	10
2-Methylnaphthalene	44	Controlled with Naphthalene	
2-Methylphenol	4700	Controlled with Phenol	
4-Methylphenol	7350	Controlled with Phenol	
Napthalene	64	10	20
Phenol	27500	15	26

TABLE 14 (continued)

PARAMETER	MAXIMUM VALUE IN GROUNDWATER	NJDEPE EFFLUENT LIMITS (monthly average)	(daily maximum)
PESTICIDES (in g/l)			
gamma-BHC	0.04	0.19	0.38
4,4'-DDE	0.10	Report	0.0012 [0.004 (MDL)[4]]
METALS (in g/l)			
Aluminum	51400	Report	250
Arsenic	51	Report	0.036 [0.5 (MDL)[4]]
Barium	1030	250	500
Beryllium	5.3	0.5	1.0
Chromium	227	8.0	16
Cobalt	33	10	20
Copper	72	4.6	9.2
Iron	115000	250	500
Lead	47	1.1	2.1
Manganese	990	100	200
Mercury	0.87	Report	0.020 [0.2 (MDL)[4]]
Nickel	119	30	60
Sodium	200	Report	100
Vanadium	421	Report	20
Zinc	9220	32	65

<Footnote>
[1] Maximum concentration of this parameter observed in the data obtained during the Phase I and Phase II Remedial Investigation (RI)

[2] The monthly average must be reported to the NJDEPE

[3] NOEC is the No Observable Effect Concentration

[4] Ground-water treatment will result in arsenic concentrations below the Practical Concentration Limit (PQL)
</footnote>

APPENDIX III

ADMINISTRATIVE RECORD INDEX

FRIED INDUSTRIES
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

1.0 SITE IDENTIFICATION

1.1 Background - RCRA and Other information

P. 100001-100022 Report: Fried Industries Site, Report on Forward Planning Activity, prepared by Roy F. Weston, Inc., June 1985.

P. 100023-100033 Report: RCRA Sampling Inspection Enforcement Request, Fried Industries, 11 Fresh Ponds Road, East Brunswick, New Jersey, prepared by Mr. Joseph V. Cosentino, Environmental Scientist, Source Monitoring Section, U.S. EPA Region II, May 17, 1985.

P. 100034-100035 Application #76-65, Unichem Corporation - Resolution Recommending Favorable Action By the Township of East Brunswick Zoning Board of Adjustment, December 21, 1965.

P. 100036-100036 Report: Fried Industries, East Brunswick, Middlesex County, New Jersey, (no author cited), (undated).

1.2 Notification/Site Inspection Reports

P. 100037-100050 Report: Potential Hazardous Waste Site, Site Inspection Report,prepared by Chief Inspector, Mr. Joseph V. Cosentino, Environmental Scientist, U.S. EPA Region II, December 1, 1983.

1.3 Preliminary Assessment Reports

P. 100051-100079 Report: Preliminary Site Assessment, Fried Industries, Inc., East Brunswick, New Jersey, prepared by Mr. Christopher S.E. Marlowe, Region II, Technical Assistance Team, Weston/SPER Division, August 1984.

1.4 Site Investigation Reports

P. 100080-100106 Fax Cover Sheet from Mr. Richard J. Spilatore, Water Pollution Control Unit, Department of Health, County of Middlesex, New Jersey, to Mr. Tom Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, re: Chemical samples from 1989-1992, Fresh Ponds Road and Dutch Road, East Brunswick, May 5, 1993. Attached are: Report: Report of Volatile Organic Analysis, prepared by Garden State Laboratories and Sample Summaries and Analysis Reports.

P. 100107-100112 Letter to the Martin Residence, from Mr. Richard J. Spilatore, Water Pollution Control Unit, Department of Health, County of Middlesex, New Jersey, re: results of testing performed on the Martin's water supply, October 26, 1988. Attached are Sample Summaries and Analysis Reports,

November 25, 1988.

P. 100113-100120 Memorandum to Mr. John S. Frisco, Chief, New Jersey Remedial Action Branch, from Mr. Douglas W. Johnson, Project Manager, Northern New Jersey Remedial Action Section, through Mr. John V. Czapor, Chief, Northern New Jersey Remedial Action Section, re: attached document concerning the recent activities at the Fried Industries Site, December 17, 1985. Site Investigation and Determination of Imminent Risk Report attached.

P. 100121-100123 Transmittal Slip to Janet from Mr. John E. La Padula, On-Scene Coordinator, Response and Prevention Branch, U.S. EPA Region II, re: the attached report, November 28, 1984. Report: Report of Analysis, prepared by Princeton Testing Laboratory, November 5, 1984.

P. 100124-100146 Report: Site Analysis, Fried Industries, East Brunswick, New Jersey, performed by Mr. Peter M. Stokely, Imagery Analyst, The Bionetics Corporation, July 1984.

P. 100147-100175 Memorandum to Mr. Robert N. Ogg, Chief, Hazardous Waste Site Branch, U.S. EPA Region II, from Mr. Walter E. Mugdan, Chief, Waste and Toxic Substances Branch, Office of Regional Counsel, U.S. EPA Region II, re: Fried Industries Site Inspection by EPA, April, 23, 1984. Report: Enforcement Requested Sampling Investigation, Fried Industries, December 1-2, 1983, prepared by Mr. Joseph V. Consentino, Environmental Scientist, Source Monitoring Section, U.S. EPA Region II, April 10, 1984.

P. 100176-100179 Letter to Mr. Philip Fried, President, Fried Industries Inc., from Ms. Harriet Zivin, Sanitary Inspector, Solid Waste and Noise, Department of Health, County of Middlesex, New Jersey, re: results of a meeting with Middlesex County Utilities Authority, March 14, 1984. Report: Report of Analysis, prepared by Princeton Aqua Science, March 5, 1984, attached.

P. 100180-100181 Letter to Mr. Walter Mugdan, Chief, Waste and Toxic Substances Branch, Office of Regional Counsel, U.S. EPA Region II, from Ms. Susan Schneck, Sanitary Inspector, Township of East Brunswick, Department of Health, Environment and Welfare, re: enclosed laboratory results from a sample of septic sludge taken from Fried Industries, November 1, 1983. Report: Report of Analysis, prepared by Princeton Testing Laboratory, October 13, 1983, attached.

P. 100182-100190 Report: Report of Analysis, prepared by Princeton Testing Laboratory, October 13, 1983.

P. 100191-100201 Letter to Mr. John Runyon, Business Administrator, from Mr. Laszlo Szabo, Director, Department of Health, County of Middlesex, New Jersey, re: Ground Water Contamination at Dutch Rd. & Fresh Pond Rd., August 3, 1983. Report: Report on Water Samples, prepared by New Jersey Laboratories, July 29, 1983, attached.

1.6 Correspondence

P. 100202-100202 Memorandum from Mr. Douglas W. Johnson, Project Manager, Northern New Jersey Remedial Action Section, U.S. EPA Region II, to File, re: Telephone Conversation with Captian Louis Ruotolo, East Brunswick Police Department concerning the Fried Industries Site, March 6, 1986.

P. 100203-100203 Letter to Mr. Bertram E. Busch, East Brunswick Municipal Attorney, of Busch & Busch, from Ms. Janet C. Feldstein, Environmental Engineer, Site Investigation and Compliance Branch, U.S. EPA Region II, re: National Priorities List - Status of Fried Industries, April 30, 1985.

P. 100204-100204 Memorandum to Mr. Richard Walka, Chief, Solid Waste Branch, AWM, U.S. EPA Region II, from Mr. Walter E. Mugdan, Chief, Waste and Toxic Substances Branch, Office of Regional Counsel, U.S. EPA, Region II, re: request for another RCRA Inspection (including Sampling) at Fried Industries, Inc., April 9, 1985.

P. 100205-100205 Memorandum to Mr. David Weill, Administrator, from Mr. L. Mason Neely, Finance Director, re: discussion which took place on March 27, 1985 concerning Fried Industries and the Task Force recommendations, March 28, 1985.

P. 100206-100206 Memorandum of Record from Mr. David P. Weill, Administrator, re: EPA's announcement that Fried has been selected for the Interim Superfund National Priorities List, October 2, 1984.

P. 100207-100218 Letter to Mr. John H. Runyon, Business Administrator, Office of the Administrator, from Mr. William K. Beckman, P.E., Senior Hydrologist, Leggette, Brashears & Graham, Inc., re: Elaboration on the Threat of Contamination to East Brunswick Water Supply Wells from Fried Industries, Inc., March 8, 1984.

P. 100219-100221 Letter to Captain Louis Ruotolo, Special Enforcement Section, Department of Public Saftey, Division of Police, from Mr. Sidney Fox, CPG, Vice President, Leggette, Brashears & Graham, Inc., re: Threat of Contamination to East Brunswick Water Supply Wells from Fried Industries, Inc., January 16, 1984.

P. 100222-100222 Letter to Ms. Susan Schneck, Sanitary Inspector, Township of East Brunswick, Department of Health, Environment and Welfare, from Mr. Alexander A. Lach, P.E., Chief Engineer, Middlesex County Utilities Authority, re: disposal of liquid industrial wastes from Fried Industries, November 14, 1983.

P. 100223-100224 Letter to Mr. Phillip Fried, President, Fried Industries, Inc., from Mr. Laszlo Szabo, Director, Department of Health, County of Middlesex, New Jersey, re: Septic System Located on Block:308.19 Lot:20.03 in East Brunswick Township, September 2, 1983.

P. 100225-100225 Letter to Resident, from Mr. Laszlo Szabo, Director, Department of Health, County of Middlesex, New Jersey, re: participation in the sampling program, September 1, 1983.

P. 100226-100226 Memorandum to Mr. Bernard G. Mihalko, Deputy Director, from Ms. Susan Schneck, Sanitary Inspector, Township of East Brunswick, Department of Health, Environment and Welfare, re: Groundwater Monitoring, Fried Industries, August 11, 1983.

2.0 REMOVAL RESPONSE

2.1 Sampling and Analysis Plans

P. 200001-200003 Report: U.S. Environmental Protection Agency, Region II, Pollution Report POLREP No. 2, prepared by Mr. Robert L. Harris, OSC, Response and Prevention Branch, U.S. EPA Region II, January 21, 1986.

2.2 Sampling and Analysis Data/Chain of Custody Forms

P. 200004-200020 Letter to Mr. Thomas Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, from Mr. Mark D. Moese, Ph.D., Site Manager, Ebasco Services Incorporated, re: Results of Drum Sampling Effort and Need for Response Action at the Fried Industries Site, July 27, 1989. Results of the Drum Sampling investigation are attached.

P. 200021-200021 Memorandum to Addressees listed from Mr. Robert L. Harris, On-Scene Coordinator, Response and Prevention Branch, re: On-Scene Coordinator's Final Report, Emergency Removal Action, Aqueous Wastes Contaminated with Toluene and Chlorinated Hydrocarbons, Fried Industries, Inc., May 12, 1987.

P. 200022-200065 Report: OSC Report, Disposal of Aqueous Waste, Fried Industries, Inc., prepared by Ms. Laura Amend, Technical Assistance Team, Weston/SPER Division, May 11, 1987.

P. 200066-200083 Report: Fried Industries - NPL Superfund Site, Sample Collection for Hazardous Classification Observations, prepared by U.S. EPA Region II Technical Assistance Team, (undated).

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

P. 300001-300024 Memorandum to Mr. Tom Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, from Mr. Richard Spear, Chief, Surveillance and Monitoring Branch, U.S. EPA Region II, re: Fried Industries Site Stream Bioassessment, August 17, 1993. Report: Stream Bioassessment, Bog Brook, New Jersey, Fried Industries Site, August 2, 1993.

P. 300025-300025 Letter to Mr. Thomas Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, from Mr. Mark D. Moese, Ph.D., Site Manager, Ebasco Services Incorporated, re: Fried Industries Site Results of Residential Well Sampling conducted in November, 1988, June 14, 1989.

P. 300026-300027 Letter to Mr. Thomas Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, from Mr. Mark D. Moese, Ph.D., Site Manager, Ebasco Services Incorporated, re: Fried Industries Site List of Residential Wells to be Sampled, October 7, 1988. List of properties attached.

3.3 Work Plans

P. 300028-300144 Report: Final Work Plan, Phase II Remedial Investigation/Feasibility Study, Fried Industries Site, East Brunswick, New Jersey, prepared by Ebasco Services Incorporated, September 1991.

P. 300145-300154 Letter to Mr. Thomas Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, from Mr. Frank Messina, Remedial Investigation Leader, Ebasco Services Incorporated, re: Fried Industries Site - Phase II Remedial Investigation/Feasibility Study Summary of Analytical Program, April 26, 1991. Tables re: Draft Work Plan attached.

P. 300155-300293 Report: Draft Work Plan, Remedial Investigation/ Feasibility Study, Fried Industries Site, East Brunswick, New Jersey, prepared by Ebasco Services Incorporated, June 1988.

3.4 Remedial Investigation Reports

P. 300294-300795 Report: Final Phase II Remedial Investigation Report, Fried Industries Site, East Brunswick, New Jersey, Volume I of II, prepared by Ebasco Services Incorporated, ARCS II Program, September 1993.

P. 300796-301236 Report: Final Phase II Remedial Investigation Report, Fried Industries Site, East Brunswick, New Jersey, Volume II of II, prepared by Ebasco Services Incorporated, ARCS II Program, September, 1993.

P. 301237-301494 Report: Final Phase I Remedial Investigation Report, Fried Industries Site, East Brunswick, New Jersey, Volume I of IV, prepared by Ebasco Services Incorporated, REM III Program, August 1990.

P. 301495-301706 Report: Final Phase I Remedial Investigation Report, Fried Industries Site, East Brunswick, New Jersey, Volume II of IV, prepared by Ebasco Services Incorporated, REM III Program, August 1990.

P. 301707-302126 Report: Final Phase I Remedial Investigation Report, Fried Industries Site, East Brunswick, New Jersey, Volume III of IV, prepared by Ebasco Services Incorporated, REM III Program, August 1990.

P. 302127-302139 Report: Final Phase I Remedial Investigation Report, Fried Industries Site, East Brunswick, New Jersey, Volume IV of IV, prepared by Ebasco Services Incorporated, REM III Program, August 1990.

3.5 Correspondence

P. 302140-302140 Letter to Honorable Frank R. Lautenberg, United States Senate, from Mr. Constantine Sidamon-Eristoff, Regional Administrator, U.S. EPA Region II, re: The East Brunswick Council Resolution (#9223), asking EPA to secure an existing fence and/or retain a 24hr. guard for the Fried Industries site, May 7, 1992.

P. 302141-302141 Letter to Honorable Bill Bradley, United States Senate, from Mr. Constantine Sidamon-Eristoff, Regional Administrator, U.S. EPA Region II, re: The East Brunswick Council Resolution (#9223) - Response to Township's letter dated March 25, 1992, May 7, 1992.

P. 302142-302149 Letter to Ms. Elizabeth H. Kiss, Municipal Clerk, Township of East Brunswick, from Mr. John S. Frisco, Deputy Director for New Jersey Programs, Emergency and Remedial Response Division, re: Response to letter dated March 2, 1992 concerning an East Brunswick Township Council Resolution (#9223) requesting EPA to secure the existing fence and/or retain a guard for the Fried Industries site, April 22, 1992. Attached are: 1. Letters and a Memorandum concerning this matter and 2. The Resolution Requesting EPA to Secure Fried Industries site, March 23, 1992.

4.0 FEASIBILITY STUDY

4.2 Feasibility Study Work Plans

P. 400001-400022 Fried Industries Site, List of Technologies for Preliminary Screening, (undated).

P. 400023-400028 Fried Industries Site, List of Alternatives for Preliminary Screening, (undated).

4.3 Feasibility Study Reports

P. 400029-400248 Report: Final Feasibility Study Report, Fried Industries Site, East Brunswick, New Jersey, prepared by Ebasco Services Incorporated, ARCS II Program, September 1993.

4.4 Proposed Plan (SOP, FOP)

P. 400249-400498 Plan: Final Field Operations Plan for Phase II Remedial Investigation/Feasibility Study Fried Industries Site, East Brunswick, New Jersey, prepared by Ebasco Services Incorporated, September 1991.

P. 400499-400683 Plan: Draft Field Operations Plan (FOP) for Remedial Investigation/Feasibility Study Fried Industries Site, East Brunswick, New Jersey, prepared by Ebasco Services Incorporated, June 1988.

4.6 Correspondence

P. 400684- Letter to Mr. Keith Moncino, Project Officer, U.S. EPA

400685 Region II and Mr. Thomas Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, from Mr. Dev R. Sachdev, PhD, PE, ARCS II Program Manager, Ebasco Services Incorporated, re: Fried Industries site, East Brunswick, New Jersey, Final Feasibility Study Report, September 9, 1993. Acknowledgement of Receipt, attached.

P. 400686-400686 Letter to Mr. Mark D. Moese, Ph.D., Site Manager, Ebasco Services Incorporated, from Mr. Thomas J. Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, re: confirmation to delay the submission of the draft Feasibility Study (FS) Report, Feb. 13, 1990.

P. 400687-400689 Letter to Mr. Thomas Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, from Mr. Mark D. Moese, Ph.D., Site Manager, Ebasco Services Incorporated, re: Fried Industries site Major Issues Raised at Alternatives Screening Meeting, February 12, 1993

7.0 ENFORCEMENT

7.4 Consent Decrees

P. 700001-700010 Consent Decree, Civil Action No. 86 - 1207 May 26, 1987.

7.7 Notice Letters and Responses - 104e's

P. 700011-700021 Letter to Mr. Phillip Fried, President, Fried Industries, from Mr. George Pavlou, Acting Director, Emergency and Remedial Response Division, U.S. EPA Region II, re: Supplemental Request for Information for the Fried Industries Superfund site, August 23, 1993. Attached are: 1. Instructions for Supplemental Request for Information, 2. Supplemental Request for Information, 3. A signed Certification of Answers for Supplemental Request for Information, and 4. Response to Supplemental Request for Information.

P. 700022-700039 Letter to Mr. Phillip Fried, President, Fried Industries, from Mr. George Pavlou, Acting Director, Emergency and Remedial Response Division, U.S. EPA Region II, re: Supplemental Request for Information for the Fried Industries Superfund site, March 3, 1993, with attachments.

P. 700040-700051 Letter to Mr. Phillip Fried, President, Fried Industries, Inc., from U.S. EPA, re: Notice to Responsible Party under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Dec. 26, 1985. Several letters attached.

P. 700052-700054 Letter to Mr. Phillip Fried, President, Fried Industries, from Mr. William J. Librizzi, Director, Emergency and Remedial Response Division, U.S. EPA Region II, re: Notice Letter regarding potential liability for the Fried

Industries Superfund Site, April 30, 1985.

P. 700055-700055 Letter to Mr. William J. Librizzi, Director, Office of Emergency and Remedial Response, U.S. EPA Region II, from Mr. John Gatarz, re: Response to June 4, 1984 Request for Information letter, June 25, 1984.

P. 700056-700056 Letter to Mr. David Rogers, Hazardous Waste Site Branch, U.S. EPA Region II, from Mr. Samuel V. Convery, Jr., of Samuel V. Convery, Jr., P.A., Attorneys at Law, re: Response of Fried Industries, Inc., to Request for Information, June 14, 1984.

P. 700057-700057 Letter to Mr. William J. Librizzi, Director, Office of Emergency and Remedial Response, U.S. EPA Region II, from Mr. Samuel V. Convery, Jr., of Samuel V. Convery, Jr., P.A., Attorneys at Law, re: Request for Information - Fried Industries, June 11, 1984.

P. 700057A-700057B Letter to Mr. & Mrs. John Gatarz, from Mr. William J. Librizzi, Director, Office of Emergency and Remedial Response, U.S. EPA Region II, re: Request for Information, June 4, 1984.

P. 700058-700086 Letter to Fried Industries, from Mr. William J. Librizzi, Director, Office of Emergency and Remedial Response, U.S. EPA Region II, re: Request for Information for Fried Industries, (undated). Attached are: Response to the Request for Information for Fried Industries, Inc., and Company Invoices.

7.8 Correspondence

P. 700087-700087 Memorandum to File, from Mr. Robert Carr, re: Fried Industries Superfund Site, Consent Decree in U.S. v. Philip Fried, President, November 30, 1989.

P. 700088-700089 Handwritten Letter to Mr. Samuel V. Convery, Jr., of Samuel V. Convery, Jr., P.A., Attorneys at Law, from Mr. Phillip Fried, President, Fried Industries, Inc., re: Mr. Fried's vacating the Premises, November 2, 1989.

P. 700090-700091 Letter to Mr. Samuel V. Convery, Jr., of Samuel V. Convery, Jr., P.A., Attorneys at Law, from Mr. Robert G. Carr, Assistant Regional Counsel, Office of Regional Counsel, U.S. EPA Region II, re: Credibility of Client's Statement - Fried Industries, circa November 2, 1989.

P. 700092-700093 Letter to Mr. Robert G. Carr, Assistant Regional Counsel, Office of Regional Counsel, U.S. EPA Region II, from Mr. Philip S. Fried, President, Fried Industries, Inc., re: Update on Mr. Fried's activity at Fried Industries, Inc., October 5, 1989. Newspaper article attached.

P. 700094-700098 Memorandum to Mr. Robert G. Carr, Assistant Regional Counsel, Office of Regional Counsel, U.S. EPA Region II, from Ms. Lisa Peterson, Office of External Programs, U.S.

EPA Region II, re: Fried Industries Mailing List, September 2, 1988. Agreement Concerning On-Site RI/FS Activities at Fried Industries, Sept. 2, 1988, attached.

P. 700099-700101 Letter to Mr. Phillip Fried, President, Fried Industries, Inc., from Mr. William J. Librizzi, Director, Emergency and Remedial Response Division, U.S. EPA Region II, re: Section 107 Notice of Fried Industries Remedial Investigation/Feasibility Study, April 30, 1985.

8.0 HEALTH ASSESSMENTS

8.1 ATSDR Health Assessments

P. 800001-800013 Report: Health Assessment for Fried Industries, East Brunswick, Middlesex County, New Jersey, prepared by the Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, August 3, 1990.

8.2 Toxicogical Profiles

P. 800014-800077 Memorandum to Mr. Tom Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, from Ms. Joan S. Dollarhide, Associate Director, Superfund Health Risk Technical Support Center, Chemical Mixtures Assessment Branch, re: Toxicity Information for Multiple Chemicals (Fried Industries/East Brunswick, New Jersey), May, 27, 1993. Risk Assessment Issue Papers attached.

8.3 Correspondence

P. 800078-800079 Letter to Mr. David R. Ross, from Mr. Tom Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, re: Response to request for a copy of the final version of the ATSDR Health Assessment, April 16, 1992. Appendix attached.

P. 800080-800080 Memorandum to Mr. Tom Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, from Mr. Arthur Block, Senior Regional Representative, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, re: transmittal of Fried Industries - Final Health Assessment, March 11, 1992.

10.0 PUBLIC INFORMATION

10.1 Comments and Responses

P. 10.00001-10.00006 Letter to the Honorable Jim Courter, House of Representatives, Congress of the United States, from Mr. Christopher J. Daggett, Commissioner, State of New Jersey Department of Environmental Protection, re: response letter concerning the Fried Industries Site, November 17, 1989. Letters attached.

P. 10.00007-10.00010 Letter to Honorable James Courter, House of Representatives, Congress of the United States, from Mr. William J.

Muszynski, P.E., Acting Regional Administrator, U.S. EPA Region II, re: response concerning the proposed cleanup of the Fried Industries, Inc., Superfund Site, November 9, 1989. Letter attached.

10.2 Community Relations Plan

P. 10.00011-10.00032 Plan: Final Community Relations Plan Fried Industries Site, Middlesex County, New Jersey, prepared by Camp Dresser & McKee, Inc., Federal Programs Corporation, February 12, 1988.

10.3 Public Notices

P. 10.00033-10.00033 Public Notice: "Representatives from the U.S. EPA Invite you to attend a Public Meeting to Discuss the Proposed Clean Up of the Fried Industries Superfund Site in East Brunswick, New Jersey", prepared by U. S. EPA Region II, September 21, 1993.

P. 10.00034-10.00034 Public Notice: "Fried Industries Superfund Site Public Meeting, Tuesday, September 21, 1993 - 7:00 P.M., East Brunswick, New Jersey" prepared by U.S. EPA Region II, September 21, 1993.

P. 10.00035-10.00035 Public Notice: "U.S. EPA announces Proposed Remedial Alternatives for the Fried Industries Superfund Site, East Brunswick, New Jersey", prepared by U.S. EPA Region II, September 21, 1993.

10.6 Fact Sheets and Press Releases

P. 10.00036-10.00037 Fact Sheet: Fried Industries Site, Superfund Update, October 1992.

P. 10.00038-10.00039 Fact Sheet: Fried Industries Site, Superfund Update, March 1992.

P. 10.00040-10.00043 Fact Sheet: Fried Industries Site, Superfund Update, December 1989.

P. 10.00044-10.00044 Press Release: "EPA To Hold Public Meeting on Fried Industries Superfund Site," for release August 9, 1988.

P. 10.00045-10.00048 Fact Sheet: Fried Industries Site, Superfund Update, EPA to Conduct Long-Term Investigation of the Fried Industries Site, August 1988.

10.9 Proposed Plan

P. 10.00049-10.00060 Plan: Superfund Proposed Plan, FriedIndustries, Township of East Brunswick, New Jersey, Middlesex County, New Jersey, prepared by U.S. EPA Region II, September 9, 1993.

10.10 Correspondence

P. 10.00061-10.00061 Letter to Mr. Robert Soboleski, Bureau Chief, Bureau of Site Management, State of New Jersey, Department of Environmental Protection and Energy, from Mr. Doug Garbarini, Chief, New

Jersey Superfund Branch I, re: Revised Draft Proposed Plan for Fried Industries, August 20, 1993.

P. 10.00062-10.00067 Letter to Mr. Tom Porucznik, Remedial Project Manager, Central New Jersey Remedial Action Section, U.S. EPA Region II, from Mr. Marcedius T. Jameson, Site Manager, Bureau of Site Management, State of New Jersey, Department of Environmental Protection and Energy, re: Fried Industries site, Draft Proposed Plan, August 16, 1993. NJDEPE Comments on Fried Industries Site Draft Proposed Plan, attached.

P. 10.00068-10.00080 Memorandum to Addresses Listed, from Mr. Doug Garbarini, Chief, New Jersey Superfund Branch I, re: Draft Proposed Plan for the Fried Industries Site, Township of East Brunswick, Middlesex County, New Jersey, July 19, 1993. Plan: Superfund Proposed Plan, Fried Industries, Township of East Brunswick, Middlesex County, New Jersey, prepared by U.S. EPA Region II, August 1993, attached.

P. 10.00081-10.00081 Letter to Mr. Edward Putnam, Assistant Director, Division of Publicly Funded Site Remediation, State of New Jersey, Department of Environmental Protection and Energy, from Mr. Doug Garbarini, Chief, New Jersey Superfund Branch I, re: Draft Proposed Plan for the Fried Industries Superfund Site, July 19, 1993.

APPENDIX IV

STATE LETTER OF CONCURRENCE

Ms. Jeanne M. Fox
Regional Administrator
U.S. Environmental Protection Agency
Region II
Jacob K. Javits Federal Building
New York, New York 10278-0012

Dear Ms. Fox:

Subject: Fried Industries Superfund Site

The Department of Environmental Protection and Energy has evaluated and concurs with the selected remedy for the Fried Industries Superfund site as stated below:

> "The selected remedy represents the first and only planned operable unit for the Fried Industries site. It addresses contaminated surface soils on the site and ground water contaminated in the underlying shallow deep aquifers".

The major components of the selected remedy include the following:

- excavation and off-site treatment and disposal of approximately 900 cubic yards of surface soil contaminated with arsenic;

- excavation and off-site treatment and disposal of approximately 2,700 cubic yards of soil contaminated with volatile organics;

- extraction of ground water contaminated with volatile organics from the bedrock aquifer and shallow aquifers, with on-site treatment and discharge to surface water; and

- appropriate environmental monitoring to ensure the effectiveness of the remedy.

Should it be necessary to discharge to Lawrence Brook, EPA would need to submit an appropriate permit application in order for the Department to determine the limitations for Lawrence Brook.

The State of New Jersey appreciates the opportunity to participate in this decision-making process and looks forward to future cooperation with the USEPA.

Sincerely,

Robert C. Shinn, Commissioner
Department of Environmental Protection & Energy

MTJ/dfh

RECORD OF DECISION
RESPONSIVENESS SUMMARY

Fried Industries Site

Township of East Brunswick, Middlesex County, New Jersey

United States Environmental Protection Agency
Region II
New York, New York

This Responsiveness Summary is organized into four sections and an Appendix as described below:

I. RESPONSIVENESS SUMMARY OVERVIEW: This section briefly describes the objectives and the format of the Responsiveness Summary for the Site.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS: This section provides the history of community concerns and interests regarding the Site.

III. SUMMARY OF MAJOR QUESTIONS, COMMENTS AND CONCERNS: This section summarizes the oral comments presented to EPA at the September 21, 1993 Public Information Meeting, and provides EPA's responses to these comments.

IV. WRITTEN COMMENTS AND RESPONSES: This section contains written comments received by EPA during the public comment period, as well as EPA's written responses to those comments.

APPENDICES: The Appendices Section contains one comment letter received from the public during the comment period, the attendance sheet from the public information meeting, and the transcript of the public information meeting.

I. RESPONSIVENESS SUMMARY OVERVIEW

The U.S. Environmental Protection Agency (EPA) established a public comment period, from September 9, 1993 through October 8, 1993, to provide interested parties with the opportunity to comment on the remedial investigation and feasibility study (RI/FS) reports, and on the Proposed Plan, for the Fried Industries Superfund Site (the Site) located in the Township of East Brunswick, Middlesex County, New Jersey.

EPA held a Public Information Meeting at 7:00 P.M., on September 21, 1993, in the East Brunswick Municipal Complex Senior Center, to outline the remedial alternatives described in the Proposed Plan (and in the FS), and to present the EPA and New Jersey Department of Environmental Protection and Energy (NJDEPE) Preferred Alternatives for remediating the contaminated surface soil and groundwater at the Site.

This Responsiveness Summary summarizes the oral comments presented to EPA at the public information meeting, the written comments submitted by citizens during the public comment period, and EPA's responses to these oral and written comments. EPA, in consultation with the NJDEPE, selected the final remedy for the Site only after reviewing and considering all public comments received during the public comment period.

The remedy to clean up the surface soil and groundwater at the Site was selected by the EPA Region II Administrator and is documented in this Record of Decision (ROD). EPA will issue a press release to notify interested citizens that a remedial decision has been made. The ROD, including this Responsiveness Summary and the other Site-related documents that EPA used to select the remedy, will be placed in the information repository located in the Reference Section of the East Brunswick Township Library for public

review.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

EPA community activities are designed to ensure that the local public is provided with information about site activities, has input to decisions about Superfund actions, and is kept well-informed about the progress of these actions. EPA initiated community relations activities for the Fried Industries Site via community interviews, conducted in June 1987, with local officials and interested residents of Middlesex County. These interviews were conducted to aid EPA in developing a community relations plan tailored to the needs of the community affected by the Site.

In order to inform local residents and officials about Site activities, a Public Information Meeting was held in the East Brunswick Courthouse on August 18, 1988, to review the proposed RI activities. In order to update residents and local officials on Site activities, a public availability session was held in the East Brunswick Public Library on March 4, 1992. In addition, the Phase II RI report, FS report, and the Proposed Plan for the Site were discussed at a public information meeting held on September 21, 1993.

The major concerns expressed by the public during the remedial investigation at the Site focused on groundwater contamination, potential health effects from contaminated water, financial responsibility for the cleanup costs, site security, and delays in getting on to the actual cleanup. Major questions and concerns that were raised during the September 21, 1993 public meeting are summarized in the following Section (Section III).

III. SUMMARY OF MAJOR QUESTIONS, COMMENTS AND CONCERNS:

Prior to the September 9, 1993 through October 8, 1993 public comment period, several residents and local officials expressed concern over the apparent lack of security at the Fried Industries Site and also the amount of time that had elapsed since the discovery of hazardous materials on the Fried Industries property. However, the most significant concern expressed by citizens and Township officials was the potential threat to municipal wells, and to the Farrington Lake public water supply, from migration of contaminants in the groundwater. Furthermore, many Township residents believe that they should be reimbursed by any Potentially Responsible Parties (PRPs) for the costs they incurred in connecting to the Township's public water supply.

Concerns raised during the public information meeting, held on September 21,1993 to discuss the selected remedy, are addressed and summarized below.

1) COMMENT: Several residents expressed concern that contaminants from the Fried Industries Site would be left in surface soils and could potentially migrate in the groundwater to the Milltown Reservoir or the Raritan River. They asked if volatile organic compounds (VOCs) are still found on-site, and if fish in the Milltown Reservoir or in ponds on the Fried Site have absorbed contaminants that could present a health hazard to someone eating the fish.

RESPONSE: Based on the results of the RI/FS, it would take a number of years for the plume of VOCs-contaminated groundwater to reach surface waters if no remedial activities take place. Because of the relatively high volatility of some of the contaminants, much of the VOC contamination has dissipated from the surface soil. According to the Risk Assessment, the VOCs still remaining in the subsurface soil are present in concentrations that do not pose significant threats to human health and the environment. Similarly, concentrations of VOCs found in pond sediments and the pond surface water do not pose any significant threat to human health. As a result, eating fish taken from the large pond on the Fried property does not pose any appreciable health risks. It should be noted, that some soils which contain higher concentrations of VOCs will be excavated to accelerate the timeframe for remediating VOCs-contaminated groundwater.

2) COMMENT: Several residents expressed concern that arsenic contamination in the soil doesn't dissipate over time, and wanted to know how EPA intends to dispose of this contaminant.

RESPONSE: EPA intends to excavate and remove surface soils where high concentrations of arsenic

contamination were discovered. After excavation and transportation to an EPA-approved off-site facility, the arsenic-contaminated soil would be stabilized. Stabilization is a process in which the excavated soil is mixed with chemicals and water, becomes bound within a solid matrix, and thereby immobilizes the arsenic. The stabilized soil would then be transported to an EPA-approved landfill for final disposal.

3) COMMENT: A resident commented that since his well is 115 feet deep, it seems logical that surface contamination from the Site would be present in his well and asked if his well would become clean after the arsenic-contaminated soil at the Site was removed.

RESPONSE: EPA initially assumed that problems with area drinking water wells were the result of contamination from the Fried Industries Site. However, data obtained during the remedial investigation clearly shows that groundwater in the immediate vicinity of the Site flows in a direction away from these wells. The contamination in these wells does not come from the Fried Industries Site, but from some other, as yet unidentified, source. Therefore, the cleanup of the Fried Industries Site should not have any effect on the quality of water from these local deep bedrock wells. In addition, EPA has received data from the Middlesex County Department of Environmental Health (MCDEH) that indicates wells in the immediate vicinity of the Site that were formerly contaminated, currently exhibit very low, if any, levels of contamination.

4) COMMENT: A resident wanted to know the origin of contaminants detected in his well, supposedly contaminated with detergents such as those manufactured by Fried Industries.

A) EPA RESPONSE: The substances referred to were most likely not detergents, but solvents such as ethyl benzene and chloroform. EPA is not certain of the origin of these contaminants. However, recent information provided by NJDEPE suggests that the contamination may have originated from the nearby Middlesex County Parks Department facility where a leaking underground storage tank problem may have existed in the past. A suggestion was made that concerned residents call the MCDEH to have their wells re-tested.

B) NJDEPE RESPONSE: During the investigation of the Fried Site, it was discovered that, in 1990, while removing underground storage tanks, a leak of 4,000 gallons of gasoline was recorded at the nearby Middlesex County Parks Department facility. It is unknown how long these tanks may have been leaking. The area has since been paved over. The Middlesex County Parks Department recently developed a proposed clean-up plan.

C) MCDEH RESPONSE: It has also been found that, on occasion, local septic systems, and substances that may have been dumped into them, can be the source of contamination in area wells. The MCDEH has not tested wells in the area for about a year, but will test anyone's well free of charge upon request.

5) COMMENT: A resident asked if beryllium that was found at the bottom of the ponds on the Fried Industries Site, will be remediated.

RESPONSE: EPA's investigation included a Risk Assessment to determine the potential risks to public health and the environment from each substance of significance. Beryllium was detected in the pond sediments, but it does not present a level of risk to public health or the environment that requires remedial action.

6) COMMENT: Several residents expressed concern that EPA's investigations may not have been comprehensive enough to allow EPA to state the Fried Industries Site is not responsible for the residential well contamination found in the vicinity of the Site and that EPA did not install monitoring wells that are as deep as local wells.

RESPONSE: Prior to the RI, general area hydrogeological information indicated that groundwater on the Fried property flowed toward Fresh Ponds Road. Based on this groundwater flow configuration, contamination was considered to be a result of Fried Industries activities. EPA completed a comprehensive, two-phase RI at the Site, and determined that contaminated residential wells in the area are upgradient, hydrogeologically, from the Fried Industries Site, meaning that the groundwater flow is not in the direction initially supposed, but rather is flowing away from these wells. Therefore, EPA is confident that contaminants from the Site do not flow towards these bedrock wells.

7) COMMENT: A resident asked what contaminants were detected in the contaminated on-site groundwater and what the contaminant level was at the leading edge of the groundwater plume.

RESPONSE: Several contaminants were detected, including benzene, toluene, 1,1,1-trichloroethane, and vinyl chloride. Vinyl chloride is most likely the chemical at the forward edge of the groundwater plume because it is a very fast moving compound in groundwater. The groundwater plume defined by vinyl chloride is presently confined to an area entirely within the Fried property boundaries. Vinyl chloride was detected at a concentration of less than one part per billion (ppb) at Well #10-D, located at the leading edge of the plume, which is below the EPA-established Maximum Contaminant Level (MCL).

8) COMMENT: A resident asked about State of New Jersey standards for vinyl chloride in groundwater and whether the vinyl chloride will sink as it migrates with the groundwater.

RESPONSE: The State of New Jersey's groundwater quality standard for vinyl chloride is 0.08 ppb, while the federal standard is 2.0 ppb. Vinyl chloride is present in concentrations that are too low to form a separate liquid phase, but will continue to migrate with the groundwater.

9) COMMENT: A resident asked if the on-site drainage is surface or subsurface.

RESPONSE: The drainage being addressed is primarily surface drainage. There are a number of marshes and swamp areas on the Site as well as a large pond. Two-thirds of the Site is considered wetlands, and the Site is drained by several streams that flow into Lawrence Brook, a tributary of the Raritan River.

10) COMMENT: A resident asked if EPA was going to remove structures and storage tanks located on the Site.

RESPONSE: EPA concluded that the structures comprising the building complex do not pose any significant threat to human health and the environment. However, during the remedial action, it will be necessary to demolish these structures in order to facilitate the use of heavy equipment, minimize impacts on wetlands areas, and enhance the safety of laborers working at the Site. The underground storage tanks and tank car still remaining on-site will be investigated during the design phase to determine if their contents, and/or any associated soil contamination, should be removed.

11) COMMENT: Several residents commented about the potential volume of soil to be excavated at the Site and asked if EPA intends to restore the areas of contaminated soil that will be excavated and removed.

RESPONSE: EPA intends to remove approximately 900 cubic yards (cy) of arsenic-contaminated surface soil from the Site. In addition, approximately 2,700 cy of VOC-contaminated soil will also be removed. After completing the excavation, clean fill material will be transported to the Site and used to fill-in the excavated areas. Enough clean fill will be used to restore the excavated areas to the existing topography.

12) COMMENT: A resident expressed concern that the proposed cleanup may have some additional effects not considered by EPA, such as the creation of major truck traffic problems in the residential area in the vicinity of the Site.

RESPONSE: EPA is aware of the limited access available to trucks and heavy equipment. During the specific engineering design of the remedy, EPA will discuss issues relating to potential traffic routes, safety, security, and contingency plans with the public and representatives of the Township. Through careful planning, the impact of remedial construction activities on the community will be minimized as much as possible.

13) COMMENT: Several residents asked if EPA was influenced in its selection of remedial alternatives and the selected remedy by potential future uses of the Site. Questions were also raised about the Site's possible future uses. A resident stated that residential, park, or passive recreational uses may be desirable.

RESPONSE: The area surrounding the Fried Industries Site is primarily residential, so there is a high potential for future residential use of at least part of the Site property. Therefore, future residential

use of the property was considered in the Risk Assessment; remedial alternatives, including the preferred alternative, were developed which would allow residential use of the property in the future. Since most of the Site is considered to be wetlands, the number of potential future residences may be limited. The Site is still owned Mr. Fried, and EPA does not intend to assume ownership of the property in the future. If ownership reverts to the Township, perhaps passive recreation may be a more appropriate use.

14) COMMENT: A resident asked if it was possible to drill further through the bedrock and find another groundwater aquifer.

RESPONSE: EPA's investigation of the Site geohydrology indicates there is no groundwater aquifer below the deep bedrock aquifer.

15) COMMENT: Several residents expressed concern about the time needed to clean up the Site, that EPA may be wasting time, and that clean up actions may not be instituted.

RESPONSE: A No Action alternative is included in all of EPA's Proposed Plans, normally for comparative analysis only. In the case of Fried Industries, EPA will be undertaking remedial work based on the risks associated with potential future ingestion of groundwater volatile organics (VOCs), dermal contact with VOCs, and inhalation of VOCs, as well as ingestion of arsenic-contaminated surface soil. The preparation of a detailed engineering design and the completion of remedial work does take time.

16) COMMENT: A resident asked when EPA would begin Site remediation.

RESPONSE: For the Fried Industries Site, the estimated time required from the start of the remedial design, through design completion, to the beginning of the remedial action, is approximately two and one-half years.

17) COMMENT: A resident asked about EPA's experience with groundwater pump and treat systems, the effectiveness of these systems on contaminants, and the rate of success using this technology.

RESPONSE: EPA is using this remediation technology at numerous sites. Each system is specifically designed based on the hydrogeological conditions and contaminants encountered at the site. During the remedial design stage, the details of well locations, well depths, pumping rates, and the on-site water treatment process system will be determined. At other sites, the effectiveness of pump and treat systems vary, based on local site conditions and the cleanup levels required.

18) COMMENT: A resident asked if EPA would have protective measures in place on the Site while excavating to prevent volatilization of on-site contaminants.

RESPONSE: EPA selects a site remedy and formulates the design for cleanup of a site in coordination with NJDEPE to ensure that appropriate measures are taken to protect on-site workers and to prevent potential airborne migration of hazardous substances that might pose a threat to the health of nearby residents. These measures would be implemented to ensure compliance with various Federal and State regulations. The specific protective measures to be used at the Site during the remedial action will be determined during the remedial design.

19) COMMENT: A resident asked if EPA considered the use of bioremediation as part of the Fried cleanup.

RESPONSE: Bioremediation of the groundwater and/or surface soil were eliminated from further consideration as remedies during the Feasibility Study screening process. The bioremediation process is only effective for certain types of organic compounds. Due to the variety of organics detected in the soil and groundwater at the Fried Industries Site, and the wide range of concentrations present, bioremediation would not be practical. Furthermore, some of the compounds found at the Site are not biodegradable, so additional treatment, such as air stripping or carbon adsorption, would be needed in addition to a bioremediation process.

20) COMMENT: A resident expressed concern that air stripping may not be adequate to remove lower-level

concentrations of volatile contaminants.

RESPONSE: EPA and NJDEPE proposed carbon adsorption for the groundwater remedy at the Site, although air stripping would have served equally well in removing the volatile contaminants. EPA and NJDEPE proposed the carbon adsorption system based on costs.

21) COMMENT: A resident asked about the potential problems with establishing who is responsible for the contamination at the Site.

RESPONSE: Mr. Phillip Fried has been identified by EPA as the only PRP. Since Mr. Fried is financially unable to fund the cleanup, the remedial design and remedial action will be funded by the Superfund.

22) COMMENT: Several residents asked about the total costs of cleaning up the Site, whether the Superfund program will have sufficient funds to complete the cleanup, and if local or state officials could aid in moving the cleanup along more expeditiously.

RESPONSE: EPA's total expenditure to date, including the Removal Action, both phases of the remedial investigation, and the Feasibility Study, is approximately $4.5 million. It is estimated that it will cost approximately $11 million to implement the selected remedy and complete the Site cleanup. Local and State officials do not control the federal funding process. EPA has not had much of a problem funding remedial designs or remedial actions in the past. However, many Superfund sites nationwide are currently reaching the remedial design and remedial action stages. Although EPA does not currently foresee any problems with the funding of the remedial action at the Fried Site, EPA cannot guarantee that funds will be available since EPA's annual budget is contingent upon Congressional approval. In cases where the availability of funds is limited, EPA prioritizes the funding of sites based upon risk posed by the site, i.e., those sites which pose the greatest risk receive funding first ("worst sites first").

23) COMMENT: A resident suggested that EPA spend less than the projected $11 million on cleanup of the Site to standards that would permit future residential use, and instead, conduct the cleanup of the Site to lesser standards and create a park in the area for neighborhood residents with excess funds.

EPA Response: The Superfund law was not written by Congress to allow that kind of decision or expenditure. EPA's actions are based on risks to public or the environment, and site remediation activities must be designed to meet specific Federal and State standards for cleanups. Under the Superfund, funds are allocated for protecting the public health and the environment from contaminated Superfund sites, and cannot be made available for other expenditures.

24) COMMENT: A resident expressed concern with the quality of the air on and near the Site.

RESPONSE: Based on data obtained during the initial investigation (Phase I RI), there are no indications of any problems with air quality on, or in proximity to, the Site. Any potential air pollution problems were eliminated when the drums, containers, laboratory chemicals, and other above-ground sources of contamination were removed during the Removal Action completed in February 1992.

25) COMMENT: A resident asked if the Site was accessible by area residents since soil contamination is a major concern.

RESPONSE: The Site property is presently accessible to those who choose to trespass on the property. However, the entire building complex and immediate area, which present physical hazards, are enclosed by a security fence. During the Removal Action completed in 1992, a large number of drums and vessels containing concentrated chemicals were removed from the Site for off-site treatment and disposal. At that time, in addition to the fence that still remains, EPA placed guards on the Site to restrict access to areas posing significant risks to human health and the environment. Once the Removal Action was completed, there was no need to restrict access because the risk of exposure to significant levels of contamination was eliminated. The guards were consequently removed.

26) COMMENT: A Resident asked what was the vertical profile of contaminants in the groundwater?

RESPONSE: The vertical profile of the groundwater contamination was not investigated because the saturated thickness of the upper aquifer was limited. All the shallow aquifer wells were screened the full vertical depth of the aquifer, so the whole aquifer was sampled. Also, wells were dug into the bedrock aquifer to collect groundwater samples over the full vertical depth of bedrock. Thus, it was not possible to differentiate contaminant concentrations in the bedrock aquifer on the basis of depth.

27) COMMENT: A resident asked what was the expected path of the contaminated water plume, and why does EPA expect that the plume will migrate as far as predicted?

RESPONSE: The path of contaminated groundwater migration is to the north-northeast. EPA has not determined how far the plume will ultimately migrate. At the present time, the data indicates that the contaminated groundwater plume still lies well within the boundaries of the Site property. Based on the potential risk of drinking contaminated groundwater under a future use scenario, EPA and NJDEPE selected a groundwater alternative to remediate the plume of contaminated groundwater.

28) COMMENT: A resident asked whether the rubble pile contributed to the surface soil contamination found at the Site?

RESPONSE: The rubble pile consists mostly of highway dividers, barriers, and other highway construction debris. The rubble pile does not contribute to the contamination problems at this Site.

IV. WRITTEN COMMENTS AND RESPONSES:

A letter, dated September 28, 1993 (Appendix A), was submitted during the public comment period. The following is a summary of the written comments in this letter, and EPA's responses to those comments.

1) COMMENT: What is the risk if the Site were left as it is? If the risk is high, why can't the contaminated soil be excavated immediately?

RESPONSE: The Risk Assessment evaluated the risk to residents for various exposure scenarios. The carcinogenic and non-carcinogenic risks caused by ingestion of, contact with, and inhalation of volatile organics from the groundwater exceeded acceptable health based levels. There were also localized areas at the Site which contained arsenic-contaminated surface soil at levels which were of significant concern to EPA and NJDEPE. Since the Risk Assessment indicated that health based levels, groundwater quality standards, and MCLs were exceeded, EPA and NJDEPE have determined that remedial action is necessary. The remedial action should commence in about two and a half years.

2) COMMENT: Why can't EPA eliminate the fence and the hazardous substances warning signs?

RESPONSE: Township officials requested as much security as EPA was able to provide under the Superfund law, and specifically requested the presence of warning signs to alert people to the presence of hazardous substances. The fence was installed around the central building complex to keep trespassers out of the structurally unsafe buildings and to provide an added measure of protection from exposure to any remaining hazardous substances.

3) COMMENT: How can EPA assure people they should not fear the Site?

RESPONSE: Based on the information EPA has collected, and on the results of the Risk Assessment, it is evident that the type, amount, locations, and concentration of contaminants present at this Site do not currently present a significant threat to human health under existing uses of the Site. In addition, warning signs have been posted on and around the Site. However, there are public health and environmental risks which do need to be addressed, especially if the land is to be used for residential uses in the future. This is not an unlikely scenario, since the majority of the land surrounding the Site is used for such purposes.

4) COMMENT: Groundwater cleanup, via the selected remedy, may take thirty years. The writer asked that EPA get off the Site as soon as possible so the neighborhood can return to normal.

RESPONSE: As indicated previously, EPA must implement the selected remedy to prevent unacceptable risks from several exposure pathways caused by the contaminated groundwater. To clean up the groundwater to a level which meets all applicable EPA and NJDEPE standards may take up to thirty years. During the remedial design, additional data related to the bedrock aquifer may provide a better estimate of time required to complete the groundwater cleanup.

APPENDICES

APPENDIX A: Citizen Comment Letter
APPENDIX B: Attendance Sheet for Public Information Meeting
APPENDIX C: Transcript of Public Information Meeting

APPENDIX A

CITIZEN COMMENT LETTER

105 Fern Road
East Brunswick, NJ 08816
September 28, 1993

Mr. Thomas Porucznik, Project Manager
U.S. Environmental Protection Agency
26 Federal Plaza, Room 711
New York, NY 10278

Dear Mr. Porucznik:

I am sorry I missed your meting on September 21, 1993.

I have an interest with others in the property adjoining Fried and have been very familiar with the Fried Site.. We have examined the EPA reports and understand the actual area of land affected is a very small part of the entire tract. We were also impressed with past statements by EPA officials that one would have to eat dirt for days in order to become ill.

The point is what is the risk from leaving the site alone? If great, what is wrong with digging out the dirt promptly and either replacing it or extending the existing pond? The neighborhood has had a pall cast over it and the question is whether this should become permanent.

Why can't you take down the fence and horrid warning signs? If the site is not a toxic avenger, what can you do to assure the neighborhood and the world that the site is not a Love Canal but a place where there should be no fear?

So, we must strenuously object to the thirty (30) year program you espouse. We implore you to get out of there as soon as possible so the neighborhood can get on with life.

I would like to know when you will be having another meeting so we can get some answers.

Very truly yours,

CARMELO R. LARIA

APPENDIX B

PUBLIC MEETING ATTENDANCE SHEET

<Figure>

APPENDIX C

TRANSCRIPT OF PUBLIC MEETING

STATE OF NEW JERSEY
COUNTY OF MIDDLESEX
TOWNSHIP OF EAST BRUNSWICK

IN THE MATTER OF:

FRIED INDUSTRIES SUPERFUND
SITE PUBLIC MEETING

Transcript of Proceedings

East Brunswick Municipal Complex
Senior Center
2 Jean Walling Civic Center Drive
East Brunswick, New Jersey
Tuesday, September 21, 1993

BEFORE:

ANN RYCHLENSKI, Community Relations
Coordinator, U.S. EPA, Region 2

CHARLES TENERELLA, Section Chief,
Superfund, U.S. EPA, Region 2

TOM PORUCZNIK, Project Manager,
U.S. EPA, Region 2

MARK MOESE, EBASCO

PAUL MARSENISON, Superfund, U.S. EPA,
Region 2

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I N D E X

MS. RYCHLENSKI: Good evening. I want to thank you all for coming out here tonight. My name is Ann Rychlenski, and I'm a Community Relations Coordinator with the United States Environmental Protection Agency, Region 2.

Tonight we are holding a meeting here to discuss EPA's proposed plan to clean up the Fried Industries Superfund site right here in East Brunswick. Before we get into the meat of the meeting I just want to tell you a couple of things: Back there is a table with some sign-in sheets. Please sign in and please print your name and your full address so that we can keep you on our mailing list.

There are handouts out there also. We have handouts that will chronicle all of the presentations that are given here tonight so you can follow along with the slides as they go on.

We also have copies of the proposed plan so you can take a good look at it in more detail, and we also have meeting agendas so you can see what's coming up as we go along.

Also, you probably noticed that we have a stenographer here tonight. This lady is here to take a transcript of this meeting. We are taking public comment, that's why we have a stenographer here. So whatever questions or comments that you ask tonight will be going onto a formal record and those questions or comments will be answered in a document that we call the responsiveness summary that EPA puts out after receiving all of the comments regarding this proposed plan. So in order to get a clear transcript and to make certain that we answer all of your questions properly, if you would please, if you do have a question, hold them until the end of the meeting and then please stand and speak clearly and please give your name so that our stenographer can get everything down accurately.

We do have a public comment period on the proposed plan. And as I mentioned, we take comments here, but we also take written comment. We have a public comment period that ends on October 8, 1993. So if you want to write your comments regarding our proposed plan tonight, you can do so. Make sure that everything is postmarked by the end of business on October 8th, and you can send your comments to Tom Porucznik, who is the Project Manager, and Tom's name and address appear in the proposed plan back there.
So make certain that you do get a copy.

In addition, we do have an information repository here. Now, information repositories are established for every Superfund site by EPA so that you can examine all of the documents that are pertinent to the site. There are an awful lot of documents that are involved with every Superfund site, most of them are highly technical and rather complex. They cannot all be presented here, however, we always have them

available to the public for the public's examination if you want to copy pages and take a look at it at information repositories. And we do have one, in fact, right here at the East Brunswick Library. If you go to the reference desk and ask for the documents on the Fried Superfund site, I'm sure the reference librarian will be happy to point you in the right direction.

I just want to go into what our agenda is here tonight and I will introduce everybody up here, along with me, from EPA.

We're going to go into an overview of the Superfund process, just a little bit about how Superfund works and what it's all about. That's going to be given by Charlie Tenerella. Charlie is a Section Chief with Superfund at Region 2.

Then we're going into the site history, background, what's happened out at Fried, how it got the way it is. That's going to be given by Tom Porucznik. Tom is the Project Manager for the Fried site for EPA.

Then we're going to talk about the summary, exactly what it is that we found out there during the course of our remedial investigation and the feasibility study that we do, and there will also be a description of the different alternatives for cleanup that we looked at. The person that's going to do that is Mark Moese, he's with EBASCO, and EBASCO is EPA's contractor on this site.

Then we're going to go back to Tom and Tom will present EPA's proposed plan or exactly how it is that we propose to clean up the site and then we'll go into questions and answers. As I said, please hold all your questions until the end.

In addition, we have here Paul Marsenison. Paul is also with EPA. He's a Project Manager and he's been working on Fried, as well, along with Tom. So you got two very well qualified folks here to talk about the site and answer your questions and let you know what we found out there.

I would also just like to acknowledge some folks that are here. There's a gentleman here, Stan Orcheski, Middlesex County Planning Board; and then Mr. Spillatori, he's with the Middlesex County Department of Environmental Health.

Do we have anybody here from New Jersey DEPE?

(No response.)

MS. RYCHLENSKI: Anybody else here from any state agencies or local agencies?

MR. RICCOBONO: Tony Riccobono, town councilman.

MS. RYCHLENSKI: Thank you for attending.

So hold your questions until the end and I'm going to turn this on over to Charlie.

MR. TENERELLA: I see a lot of familiar faces here. We had an availability about a year ago I think. I think a lot of you were there, so we'll try to keep out presentation short tonight and then we'll go into questions and answers and maybe get more done that way since the group is pretty small.

I quickly wanted to run over the Superfund process and where we are in the process now for those of you who don't understand it.

Way back when any site is looked at for inclusion on the National Priority List to be a Superfund site for national attention by US EPA, sites are discovered, there's an initial investigation and evaluation of the site aspects, and between that and the placement on the NPL or soon afterwards, if necessary, a removal action. Anything that has to get off the site pretty quickly because we think it's a severe hazard, an imminent hazard that has to be removed quickly, will be done.

At Fried Industries, as many of you know, that was done a couple of years ago. There was a rather intensive removal action at Fried Industries to get most of the free-standing chemicals out of the manufacturing operation there. That's been completed.

After that, any site on the NPL goes through a remedial investigation phase. At Fried Industries that's taken quite a bit of time because of some differences in terms of groundwater flow in this area and additional information that we collected over the last couple of years.

The remedial investigation has been completed and, also, something we call the feasibility study, which gives us some ideas about how to clean up the site. From the feasibility study we select an option that we feel is the best one for cleaning up the site and we present that in the proposed plan, which you have copies of tonight, and have a public meeting and public comment period, which we're doing now, before EPA goes ahead and issues its formal record of decision for the site. That will occur in the next couple of months.

Once we issue our record of decision, that's our legal document and our formal government approval to, in Fried's case, to spend government money to design the remedy and then actually implement the remedy.

You can see from just the listing in this chart that a lot of the work in the Superfund program that gets to a site cleanup has already been done. From the record of decision, which is our important document that says this is exactly how we want to do the cleanup, we'll go to a design, which is the preparation of the plans and speculations, do a bid package, and then after go to construction and then there may be a long-term operation and maintenance phase. In fact, there will be here at Fried. After that the site is completed and delisted from the Superfund program from the National Priorities List.

It's a long process. We have a lot of complaints that it takes a long time to clean up a Superfund site since the program was initiated in 1980. We found it's very difficult, a lot of this is very cutting-edge technology, the kinds of risk decisions that we have to make are very difficult to make and sometimes just the contractual and legal problems that we get involved in on sites it takes a considerable amount of time. That's the unfortunate aspect of the program that's a reality.

Tom is now going to go into the site history and the remedial investigational briefly on what's occurred there.

MR. PORUCZNIK: My name is Tom Porucznik, I work within the Superfund program along with the other fellows here except Mark. You have maybe heard this before, but let me, just like I said, give you a very brief overview.

The site itself is roughly rectangular in shape and occupies approximately twenty-six acres located along Fresh Ponds Road. The address is 11 Fresh Ponds Road. Of course, it's in Middlesex County and East Brunswick Township, New Jersey.

There's an entrance over here to the site. This is a dirt road which you can access the site from Fresh Ponds Road. That's the primary access and the only access, actually.

The site itself is comprised of a building complex over here, where most of the activity at the site took place. You also have a number of marshes and swamp areas, such as this here and here. You also have a large pond. And, in fact, two-thirds of the site is considered wetlands.

There are three principal drainage areas at the site. One is this swamp area here, which drains along this side and down in this direction toward Lawrence Brook. This large pond also drains -- in fact, all three drain into Lawrence Brook, but this one here drains like so and joins in with this previously mentioned one and then Bog Brook, along this edge here. They all drain into Lawrence Brook, which ultimately leads to the Raritan River.

The history of the site is as follows: Philip Fried operated for approximately twenty-four years before he ceased operations, and that was about 1988. He was involved in the manufacture of a number of

products, including industrial strength detergents, floor finishing products, adhesives, algicides and also antifreeze products. When he operated there were a number of activities that resulted in contamination at the site, one of them was discharging processed waste onto the grounds in this area. Also, pumping material from the warehouse that was often flooded right onto the grounds. Improper handling and storage of drums. Also, leaking drums and rinse water were discarded and laboratory equipment, chemicals, were not properly labeled and they were not, you know, the housekeeping practices were very poor, as well as several processing and septic tanks located in the immediate vicinity of the buildings.

In 1983 along Fresh Ponds Road a number of homes, apparently, had taste and odor problems in their residential wells. The County and the Township took some samples and, in fact, it was corroborated there was a problem. Five of those homes, in fact, had chloroform and up to two hundred fifty parts per billion in the residential wells.

Since that time the Township has placed them on public water supply.

In December 1983 ten agencies in cooperation with the County and in cooperation with the Township descended upon Fried and did an extensive survey and investigation of the site and determined that, yes, there was contamination of the site and that ultimately lead to the site's listing on the National Priority List. It ultimately was finalized on the Priority List in June of 1986.

That brings us up to where EPA got involved with the remedial investigation phase, and at this point I'd like to turn the talk over to Mark Moese.

A VOICE: Quick question.

When you said drainage, all that drainage, how much of the drainage is surface drainage, how much of the drainage is subsurface?

MR. PORUCZNIK: I'll answer this question, but I'd like to refrain from answering any further ones until the end of our discussion.

All that I discussed just now is all surface drainage. Again, this is a surface marsh and it drains along this seam here, which at times runs dry. There's also a pond which drains across the site in this direction, leading up somewhere in this area. Then, of course, here, Bog Brook, coming on this end of the site, and that merges with the other two, which ultimately flow into Lawrence Brook and then to the Raritan River.

Again, those are all surface waters that I discussed.

MR. MOESE: What I'd like to do is briefly go over the work which EBASCO has performed at the site as part of the remedial investigation and then go into the discussion on the feasibility study that was performed.

Over the course of the work on the site during the remedial investigation EBASCO has conducted many and numerous types of tests and collected many samples. We started out doing a geophysical survey of the site looking for buried material, evidence of buried drums and so forth. We then ended up going through a soil gas survey to try to define hodge podge or areas of soil contamination on the site.

Based on these first two tests we ended up collecting two hundred and ninety-eight soil samples on the site for chemical analyses. These were comprised of surface soils, soils from test borings, subsurface soils, as well as monitoring well soils, soils from drilling the monitoring wells.

In addition, we collected ten samples from the taps of homes along Fresh Ponds Road and Dutch Road during the course of this investigation.

Based on the geophysical surveys we excavated nineteen test pits at various locations around the

site looking to determine what the EBASCO anomalies may have been that we discovered. We did a well inventory to examine the usage of groundwater in a five-mile radius from the site. NJ DEPE just this past summer did a brief investigation, I believe it was in July, of soil concentrations of contaminants or other compounds in and around the Fried site. EPA's Edison branch came out and did what is known as a stream rapid bio-assessment to try to determine the impact of the Fried Industries site on Bog Brook and the other drainage areas in and around the site.

From the monitoring wells which we installed on the site we collected two groundwater samples, we collected one hundred air samples during the course of this investigation for chemical analyses, sixty-six surface water samples from the various brooks and streams and the pond, forty-nine sediment samples, seventeen wipe samples in the building where we would go in and collect contamination off the walls in the building. We performed an aquifer pump test, which was used to try to characterize the groundwater characteristics for the aquifer so that EPA would try to choose an alternative during the feasibility study. We examined and re-examined the impacts of the contamination on the site flora and fauna on the site. In addition, part of the remedial investigation is a risk assessment, both the human health and an ecological risk assessment.

The risk assessment evaluated health risks to people from groundwater, surface soils, subsurface soil, surface water, sediment, the ingestion of fish from the streams and ponds, anything that was found in the air was looked at, as well as if the town or a contractor was to build homes on the site, if any of the subsurface contamination would leak into the basements of these buildings and cause a potential problem.

Based on the risk assessment it was determined that there was an unacceptable risk to the levels of contamination found in both the bedrock groundwater and the shallow aquifer groundwater at the site, and although the soils indicated risks within EPA's risk range, both EPA and NJ DEPE had concerns about the elevated concentrations of arsenic at some specific locations in the surface soil and are proposing with DES and the proposed plan to help remediate those areas.

Based on this we're looking at contaminants of interest for the site and the site soils. We have some volatile organics at some locations and arsenic in the groundwater. The primary problem is due to the volatile organic compounds.

And the building and tanks and so forth, there are some concerns as of this moment.

Based on the levels of the contamination found in the site soils, these are the areas that during the feasibility study we're looking at for remediation purposes. This one here, this location here, here, here, and part of here are arsenic contamination areas. Where this one, this one, and part of this one, again, are volatile organic contamination areas.

Also, as a result of the remedial investigation the areas within here is the suspected or known area of the surface water aquifer contamination from the surficial aquifer with the bedrock aquifer being assumed to be somewhat similar, but not as well-defined as of this time, with groundwater flow going off to the northeast off of the site.

The next part of the work that was performed by EBASCO was to do the feasibility study.

The first stage of the feasibility study is to screen and examine technologies and process materials on how to clean up the contamination of interest at the site. This slide here is for soil, I'll show you another slide next for groundwater.

EBASCO considered everything from no action, from not doing anything further at the site. Using limited action, institutional controls, which is to just post warning signs, maybe put a fence up and have reviews of the contamination levels every five years. Containment of the soil contamination was examined through use of several capping methods, either soil, clay or synthetic membranes, however, it was felt, at least with the capping alternative, the capping technologies, that it wouldn't have been effective for this site because it would not have reduced the leachate of contamination to groundwater from the soils. Removal of the soil is generally one that would be to excavate it off out of the areas.

Several ways of treating the contaminated soils was looked at. Incineration, oxidation, soil washing, using microbes for biodegradation processes or vitrification of the soil.

A lot of these were not considered any further after this because they're just not technically feasible to do it at this location.

With the groundwater, again, we were required to look at no action, limited action alternatives, and then went into other site specific methods as containment, using sheet piling or slurry walls of some sort to try to contain the upper aquifer groundwater or the bedrock groundwater, however, due to the fact that there's obviously, some sort of a connection between the upper aquifer and lower aquifer these would not be technically feasible to try to contain that at this point in time.

Extraction, dewatering and pumping of the aquifers, this would be presumed acceptable for the bedrock aquifer. The results of the aquifer pumping test, which was done during the remedial investigation, showed that it would not be an appropriate method to do for the surficial aquifer.

Treatment of the groundwater, everything from air stripping, chemical precipitation, carbon adsorption was considered, source control. This was to look at specific areas of soil on the site that may be high and then treatment of that soil and then disposal of both the water and/or the soil. We looked at either sending the water to a local waste water treatment plant, which we called the local facility, they would not accept the treated or untreated water, or sending it off to a TSD facility, or just discharging the treated water to the nearby surface water.

The alternatives which we looked at in depth in the feasibility study of the soils were no action, limited action, institutional controls. We examined excavation of the arsenic contaminated soil on site, stabilization of that material on site, and then disposal of that material on site once we're finished.

The cost range is anything from, you know, forty thousand dollars to about seven hundred thousand dollars.

For groundwater we also examined no action, limited action alternatives, and then the other final alternative for groundwater was the pumping and treatment of the groundwater with limited source extraction of some of the highly contaminated volatile soils and then treating that groundwater with one of two options, either just using activated carbon or air stripping the groundwater.

Again, the cost estimates range from forty thousand to about twelve million dollars for these alternatives.

What I'd like to do is turn this back over to Tom to discuss the EPA's alternatives.

MR. PORUCZNIK: Starting with the list of the summary of remedial alternatives that Mark just indicated to you, you can see that there are four for soil and three basic alternatives for the groundwater.

In the proposed plan that we handed out tonight, on Page 9 you'll notice that there are a number of evaluation criteria. These evaluation criteria are the criteria used to assess these remedial alternatives. And after we complete the assessment, which can be found in the feasibility study, by the way, which is located in the repository in the East Brunswick Library, this is what we came up with. It's actually a combination of two, as you saw from the previous list, one involving surface soil and the other for groundwater. That involves the excavation of nine hundred cubic yards from areas of elevated arsenic contamination. We would take that material off site and stabilize it off site with ultimate off-site disposal.

That is alternative SC-4. That's what we designated it as in your proposed plan.

Similarly, for the groundwater we chose alternative GW-3. That involves extraction of groundwater from the bedrock aquifer and collection of groundwater from the shallow aquifer. The combined stream would be treated via metal precipitation, followed by organic treatment using activated carbon. The treated water

would then be discharged to surface water and that surface water would be the Lawrence Brook River system.

Included in this alternative we also decided to excavate approximately twenty-seven hundred cubic yards of material, of soil that is, from areas where there's very high concentrations of volatile organic contamination. That also would be treated off site and disposed of. That would be, most likely, through incineration.

That's, basically, the preferred alternative that EPA has come up with in conjunction with New Jersey DEPE. That's what we bring before you today for comment.

MR. TENERELLA: Well, that summary is the selected alternative that we have in our proposed plan. Before we make our record of decision on that there is a comment period and we are now available for questions on the remedy or the remedial investigation or any other questions you might have on the site. We'd like to take them one at a time and remind you that we have a stenographer So please identify yourself.

There will be a transcript of this record in the official administrative record of the site. ?? needs to have your name and any other identifying criteria, like a public official or whatever you might be, then we'll answer the questions one at a time We'll also stay as long as we need to ?? answer any questions. So don't fear a?? lack of time.

MR. ROSS: David Ross, East Brunswick. The address is on the sign-in sheet.

In the SC-4, does that include the removal of those buildings back there and the underground tanks?

MR. PORUCZNIK: It will include -- first of all, we have to take a look at those tanks. The buildings themselves will probably not be removed based on risk. We may remove them because they may be a threat to the actual remedy. In other words, when bulldozers and heavy equipment get in there we may have to move the buildings and obstructions out of the way.

MR. TENERELLA: As we go on in our cleanup a reminder is, we don't own the Fried Industries site, Phil Fried still does own the property. So we will go in on the site and clean up environmental hazards, hazards to public health. Anything that is an eye sore, for example, is not something that we'd be normally eligible to just clean up.

The structural integrity of some parts of the building are a little bit questionable, so when we have heavy equipment there we may have to take them down just for the safety of the workers, but that wouldn't be the intent of the cleanup.

MR. ROMERO: Joseph Romero, East Brunswick resident and member of the Environmental Commission.

I have to leave in about five minutes for something else. That's my problem, but I'm sorry about that. I just have some questions. Some may be relevant and some may not be.

Nine hundred cubic yards doesn't sound like a heck of a lot in relation to what has been described as the problem. And I was here at the previous hearing, so I just would like to comment on that.

MR. TENERELLA: One of the reasons it took us so long to do our remedial investigation, in fact, for those of you who have some familiarity of the site over time, it's been a couple of years and, actually, it's been put into two phases, there was some question as to what we might find on the site because of the erratic kinds of activities that might have been performed either in the buildings or surrounding the buildings. That's why the removal action for this site -- that's why we went in and took out the tanks and concentrated chemicals, vials and bottles of different chemicals in the building. It was such a concern for us. And that alone took over a year or so to complete.

That's all been done. We wanted to make sure that we didn't have any kinds of concentrated chemicals that might have been spilled around the building. We thought we might have some other problems areas, and it turned out, based on our risk calculations for the problems we had remaining after removal took

place, that the major problem was from arsenic in the soil. One single very specific problem with one chemical, one metal, arsenic. That's why you see just those small concentrated areas removing the arsenic in the soil.

The VOCs, which show up in the soils, also didn't show up in the groundwater. We want to protect the groundwater supply.

The one slide that you did see that Mark put up had a big sort of blob on it. It didn't really have a real clear sense of the groundwater flow. It didn't appear well on the projection, but it's in the notes.

The groundwater flow is not going, as I think some of you are aware now, is not going toward Fresh Ponds Road as we had originally assumed when we did our early investigation, but, rather, --

MR. MOESE: Northeast.

MR. TENERELLA: So we're doing a groundwater protection based on probably industrial activity on the site that caused those kinds of chemicals to spill into the soil and then hit the groundwater. There is no risk in the soil from the VROs or the volatile organic chemicals that we found there, but it will be quicker in terms of a remedy and more efficient to take a certain amount of concentrated soil with VOS out before we start or concur with starting our groundwater pump and treat remedy, and that's why we're taking that additional soil.

The real thermal kinds of activities are associated with the hot spot, and that's what we see remaining on the site. That's after a quite extensive study to make sure we don't have any surprises on the site.

MR. ROMERO: Just a couple more questions. I think you answered one of them, which is who owns the site. I take that to be Fried.

MR. TENERELLA: He owns it now.

MR. ROMERO: I don't know how he comes to deserve to continue to own the site, but maybe that's off the point of this meeting. But the following question which I want to ask is, to what extent are your alternatives influenced by what kind of use this site might be put to in the future, that's a question; and then, are they influenced at all; and then the following question is, what uses would this site have in the future?

MR. TENERELLA: The assumptions we made based on the surrounding area is that it would be for residential use just because the surrounding area is mostly homes and not industrial, just because it's zoned that way now. So our assumptions were for the most rigorous cleanup, which for us would be a residential criteria, and that's what we're using.

Now, Phil Fried owns the site right now. Whether he would continue to own it because of lack of payment of taxes or something like that is another question. EPA would not take ownership of the site at any time in the future. It wouldn't be our site other than just take responsibility for the cleanup of the property. The property would, theoretically, be able to revert back to tax rolls if the Town took it over for nonpayment of taxes in the future.

The reality in terms of it being a residential cleanup for our criteria purposes is different from the reality that it's sitting in a wetland. In fact, half of these buildings are sitting in water. It made it a little difficult for us to get around on the site. There's a very high water table on the site and it probably wouldn't be easy to construct houses on a large part of the site. In fact, that was the problem we had in setting up our remedies. One of the reasons we're doing a lot of off-site work is, we don't have a lot of dry land, basically, to establish a set of treatment systems on the site and still be able to stage on the site. There's not enough room that's dry, and I think that's going to be a problem realistically for land use on the site too.

MR. ROMERO: Could the site be used for passive recreation?

MR. TENERELLA: Yeah.

MR. ROMERO: Like fishing and boating and whatever?

MR. TENERELLA: Yeah. With some assumption that Phil Fried is not continuing for one legal reason or another to own the site I suspect that would make an excellent use of the site, and the kind of remediations we're doing will allow for that.

MR. CRESTI: Aldo Cresti. I live on Fresh Ponds Road, Number 24.

You mentioned the product industrial cleaners, like floor cleaners and kinds of detergents. Those things are all water soluble. Now, these were manufactured less than thirteen years ago on the site.

MR. PORUCZNIK: Up to '87.

MR. CRESTI: It has been raining since then, so none of the stuff has been washed away. Is there a possibility that so much of the stuff has been left behind in the surface?

MR. PORUCZNIK: That was only some of the materials. He also produced algicides, also produced adhesives and other materials too. Also, there was a lot of drums that were found on site, twelve hundred that were removed during the removal action that contained a tremendous array of chemicals. There was a lot of different chemicals and they weren't all water soluble, believe me.

MR. CRESTI: Then you mentioned volatile organic compounds. Typically, if they're volatile, they'd be going away in the air. You still find them?

MR. PORUCZNIK: Yes, especially when you go down deeper into the soil. You're correct when you mention that a lot of the volatiles have dissipated from the surface soil, maybe the top two, three, four feet, but when you go deeper it's still found there in significant amounts.

MR. CRESTI: What I'm driving at is, as the pond exists now I see people fishing. Evidently the fish must be living. Also, the Raritan River, do we find traces of the chemical all the way down to those sites?

MR. PORUCZNIK: I think what you were referring to a second ago, this pond over here, remember that this pond is really upstream. In other words, the pond flows in this direction, and all the drainage flows really away from the pond. So you really don't have any significant cross contaminations coming from here to here. There is a little bit flowing in this direction here, but, really, this is sort of like an isolated system almost over here to a certain extent.

MR. CRESTI: If you go down to Milltown, this water drains into Milltown.

MR. PORUCZNIK: You mean down here?

MR. CRESTI: Right.

Again, people do fish. Any problem?

MR. PORUCZNIK: Correct me if I'm wrong, Mark, but based upon the information that we found in the remedial investigation, there's only very, very small quantities of contamination, especially organics, down here. In the future, if we do not do anything, the groundwater -- do you remember the plume that was shown up on the screen before, the blue plume?

The blue plume is actually groundwater contamination and it's the extent of something like this. That will continue to drive in this direction and the groundwater plume and groundwater table are being

pinched out and upwards. It will eventually enter the surface water, but at this point it hasn't yet in significant quantities whatsoever. I don't know when, but maybe several years from now, maybe ten years from now contamination will reach there in very significant quantities.

Am I correct?

MR. MOESE: Yes.

MR. CRESTI: Also, how about the arsenic compounds which you mentioned? Arsenic is a metal, it's not going to go away. When you take it away where does it go? Where do we put it?

MR. PORUCZNIK: In this particular case what we decided to do is to remove it off site and stabilize it. That's a process by which, in this case, arsenic is sort of put in some kind of a matrix and it's unable to move, it's unable to be mobile, for that matter, or to be in contact with anybody. So it's taken off site, also, and will be disposed of appropriately so that it can't be of any danger to anyone.

MR. TENERELLA: There are approved landfills, industrial landfills, that will accept that kind of material once it's stabilized, which is just to fix the arsenic in place. It's not like we take it in someone else's backyard and dump it there.

MR. CRESTI: The arsenic concentration is stable, it's not changing over several years? It's still around the same concentration as it was originally?

MR. MARSENISON: Right. The arsenic will never go away. The stabilization is really like a concrete block. The soil is mixed in, and it looks like a concrete block, and then we'll dispose of it in that landfill and it just stays there.

MR. CRESTI: Once that gets removed the earth around it is going to be clean?

MR. MARSENISON: Right.

MR. GIRINZO: Anthony Girinzo, 12 Fresh Ponds Road.

My well is a hundred and fifteen feet deep. We found all this stuff in my well. I had originally sampled and gave it to Mr. Sabo in Middlesex County when all this started.

MR. PORUCZNIK: That's back in 1983 you mean?

MR. GIRINZO: Yeah, even before that.

I can't understand why if it got back into my well, which I live across the street from Fried, a hundred and fifteen feet down, why it couldn't be in that pond because that pond is spring fed and all the water tables down there. It's got to be, I would imagine, getting into that pond because if that pond cleared up, then my well should be cleared up, no?

MR. TENERELLA: Two comments on that: First, on a risk basis, Mark, I don't remember what the risk analysis was on the samples.

MR. MOESE: Very low.

MR. TENERELLA: The samples were very low.

MR. MOESE: Very low.

MR. PORUCZNIK: There is some contamination, but it's very, very small.

MR. TENERELLA: Unlike what you would drink.

There's a difference between contaminants in terms of edible fish and drinking water. I'm not sure we considered the pond's water drinkable for that reason.

Also, we were surprised because of the kinds of problems we saw in homes along Fresh Ponds like yours. There was an assumption because of the activity at Fried that the groundwater flow and the general flow in this whole area is that way, from, say, Fried toward your house, that must have been the cause. So our initial remedial investigations were directed to an assumption of groundwater flow towards Fresh Ponds Road.

The initial investigations proved us wrong and that in the general area the flow is that way, but specifically around Fried the flow is up away from you.

MR. GIRINZO: Yeah, but that has nothing to do with the underground waters.

MR. MOESE: Bedrock also.

MR. PORUCZNIK: Let me show you what Charlie just said.

Again, originally the groundwater, based upon all the information we have from the USGS and also, I think, some local studies, I think it was Leggett and Shears, I forget the name, they indicate that groundwater flows in this direction, however, we found in the small area of the Fried Industries site that the groundwater does not flow in this direction, it flows in this direction. Roughly paralleling almost the surface water drainage flows in this direction.

The bedrock aquifer also is a few degrees off, but they're basically both flowing in this direction, away from these homes.

MR. GIRINZO: Now, is there a chance in the future of our wells clearing up after we get this arsenic out?

MR. TENERELLA: Not from Fried Industries.

Just like in doing our investigations, as we disprove even our assumptions that your problems were caused by Fried Industries, the cleanup at Fried Industries isn't going to solve your problems now because, obviously, there's a source of contamination that's hitting your wells that's not Fried.

MR. GIRINZO: It's not?

When I originally took my well for testing I had it done by New Jersey Dairy Labs. They told me what was in the water before I knew what Fried was making, and it was the same thing, it was industrial detergent, all purpose cleaners, stuff like that. That's what New Jersey Labs told me. I didn't even know what Fried was making. I knew what he was making before I went down to talk to him.

MR. PORUCZNIK: May I ask you a question? Just out of curiosity, have you had your well sampled recently?

MR. GIRINZO: No.

MR. PORUCZNIK: The reason I'm asking that, we have some data from local sources that does indicate that there's far less contamination and a lot of wells that were contaminated don't even have any contamination anymore. I would suggest maybe contacting maybe the Township or the Middlesex County Department of Environmental Health maybe to look into that a little further. That would be one possible alternative.

MR. TENERELLA: Some of the contaminants that were found are relatively common in industrial use or industrial debris or things like that. It could be coming from another kind of an operation. You still get the same kind of chemicals.

Very clearly, and, again, it took us a while to figure that out because the assumptions we made are the assumptions you're making, Fried Industries is not the source of contamination.

MR. GIRINZO: You're talking groundwater. Now, you can stand in my front yard and you can tell that groundwater is not going to flow to my house because Fried is not directly above me. I can look at it and --

MR. PORUCZNIK: Isn't your well a hundred and twelve feet deep?

MR. GIRINZO: A hundred and fifteen.

MR. PORUCZNIK: I guess what you were referring to before is surface grade?

MR. GIRINZO: I'm not talking about surface.

MR. PORUCZNIK: What I'm saying, just because your house appears to be higher up than Fried, that doesn't mean that you couldn't have it flow. That's not the case.

MR. GIRINZO: I'm saying it could. I'm saying once you get down a hundred and fifteen feet, like at the bottom of my well, my water table that I'm on and the water tables that he might be contaminating could be all level, on the same table.

I'm not educated in this field, but I'm using just a little bit of common sense. If he's dumping it, it's washing through and it's going down a hundred feet or washing into a table that may be streaming into mine, I'm going to get it.

MR. TENERELLA: That is what we analyzed. In fact, Mark, do you remember the exact well locations and the kind of readings you were getting to show the trend?

MR. MOESE: We had installed right here, right at the corner, a shallow well and a deep well. The deep well was drilled at approximately fifty to fifty-five feet beneath the bedrock. Same thing with the well here, which is 5D. We have another one back here, which is 14D; and another one over here, which is 10D. Well 1D has low concentrations, some benzene. 5D is clean. Nothing.

MR. GIRINZO: How deep is that one?

MR. MOESE: Same as the other one.

MR. GIRINZO: Fifty-five feet?

MR. MOESE: Fifty-five feet beneath the bedrock.

So you're talking, probably, at that point along Fresh Ponds Road, I think we had twenty feet of sand before we hit the clay, so you're looking at seventy-five to eighty-feet deep.

A VOICE: Isn't it possible that if you drill ten feet more that you could have broke through the so-called bedrock into another groundwater aquifer?

MR. MOESE: Not with the geology that you have on the site.

This well, 14D, which is behind the building, is highly contaminated. 10S or 10D, I should say, has low levels of contamination.

Again, 5 here has nothing. So it's basically, you know, based on the well water elevations of these wells, it indicates the bedrock does flow -- it's a couple degrees off from the surficial aquifer, but almost north, northeast.

MR. GIRINZO: You can understand where we're coming from. I had my well tested. They told me there is an industrial detergent in your water. I went down to talk to Mr. Fried. He hands me a bottle of it. "Here, try one of my products." I said, "I don't need it, I've been drinking it."

MR. PORUCZNIK: I'd just like to mention one other thing.

I know, again, I had some data given to me from Middlesex County Department of Environmental Health. Although it may not involve your particular health, it does indicate that in that general area that the homes that were contaminated at one time do seem to have, if any contamination remaining, very low levels.

So I was going to say that maybe you should, you know, contact Middlesex County Department of Health and see -- I don't know what the scenario is to maybe have your well retested, if you have to do it yourself or if they do it as part of a testing routine or procedure every few years, but check with them and see. I think the first step would be to retest the well first and see whether or not you still have contamination.

MR. McGOWAN: Dan McGowan.

You told this gentleman that Fried Industries is not the reason why his well was polluted with the detergent. Now, if Fried Industries wasn't, then who was? Where did he get these liquid detergents, like anti-freeze and the other chemicals you talked about?

MR. PORUCZNIK: First of all, I don't think it was detergent. I think the contamination that was present was ethyl benzene, benzene. Going back to 1983 I think we're talking about chloroform in those five homes.

Again, I know what you're trying to say. If it's not Fried, then who is it?

We're not sure, to be honest with you, right now because we have been primarily involved with Fried and Fried is a problem onto itself, however, there are other possibilities. I'd like to name one. It's just a possibility but it's been cleaned up. That particular facility is the Middlesex County Department of Parks.

It's a possibility. We do understand that going back several years ago that there was a problem with their storage tanks and it's been fixed since then, but it is possible that at one time they could have been the source. Again, I emphasize could have been the source. We don't know for sure because we're involved with Fried right now. It's possible maybe it would be a good idea to talk to New Jersey Department of Environmental Protection & Energy about that when you get a chance.

MR. McGOWAN: You also talked about if you were going to clear the groundwater system; and if you were not, the contaminants were going to continue into the Milltown Reservoir where they fish and all that.

What happens in five years when, say, that contamination goes into the Milltown Reservoir and where they drink and where they fish and what happens if the problem becomes worse instead of taking care of it now, instead of wasting another five years on research?

MR. PORUCZNIK: I'm not sure what you mean by "the Milltown Reservoir."

MR. TENERELLA: You mean if once we do our remedy if there's still a problem?

MR. McGOWAN: You said we might not clean it up. You said if we clean this up.

MR. TENERELLA: I think what Tom was suggesting to you is that in our choices one of the choices we have is not to take an action. And the problems that we have are potential problems for the future as the groundwater moves, therefore, we will take an action here as opposed to not taking an action.

MR. McGOWAN: Then you're still wasting another five or six years.

MR. TENERELLA: No, we are deciding now to take that action because of that potential. In addition to that we have something called a five-year review at all our Superfund sites once we take our action. If something is not working quite well, if we're not getting our chemicals out or there's still risk, we'll go back and review the site again.

MR. RICCOBONO: Tony Riccobono.

How soon do you think you could start remediation at the site?

MR. TENERELLA: What's been happening lately is the design turn around, I'd say, is about two to two-and-a-half years. In terms of getting all the plans and specs and everything in order in the design. Fried Industries right now, because Phil Fried is not a major company, we don't have any major costs involved to establish their liability for cleanup.

MR. RICCOBONO: You don't have the litigation problems that you would normally.

MR. TENERELLA: Exactly. And that's pretty clear with us right now.

So we'll go ahead in funding it under the Superfund program for redesign and then remediation. Because of the scale of remedy here it will probably go to the U.S. Army Corps of Engineers for bidding for the design. We're going to have to wait. We're at the end of our fiscal year right now. We're coming to our decision on Fried with the record of decision sometime in the fall, I guess, now. The next concern would be appropriations.

MR. RICCOBONO: I was just going to say, how is your funding at this point in time? That's another question.

MR. TENERELLA: I'm not sure what's going to happen in this next fiscal year on funding. In past years we have not had a problem funding our designs or our actions immediately when we needed to. We're not sure yet if we're going to have a problem this coming year. So that's a little bit of an open question right now.

MR. RICCOBONO: How would this site fit in with your other sites, the fact that it can be remediated, you can get a good remediation, you can stop it from reaching the streams and whatever? How would it affect it that way?

MR. TENERELLA: Over the years it's taken a long time on a number of Superfund sites to do the remedial investigations to determine the cleanups. A lot of those sites, including Fried, have now gone through that pipeline and are backing up into design and construction and we're seeing a problem nationally in terms of the amounts of money available for design and construction for the first time. In past years there was plenty of money in those pots available because a lot of sites weren't hitting that area yet. Now all of a sudden there's a glut of sites hitting that area.

MR. RICCOBONO: Is there any possibility of local officials or state officials to try and move things along? I mean, we have an environmental vice-president now.

MR. TENERELLA: We're hoping that we won't come to a point where we have to make those kind of choices among sites in terms of on a risk basis which one is going to go into design first. Right now we're sort of at a wait-and-see attitude in the agency. We never had a problem like this before. We're just a little hesitant to promise that everything is going to be fine this year. We're hoping that it will pass through and we'll have a sufficient amount of money. One advantage for Fried right now is we don't have litigation issues. That will simplify the timing problem of getting it into design with the Corps. We'll at least get it into that process a little quickly.

MR. RICCOBONO: The nine hundred cubic yards, is that a fixed figure, is it an arbitrary figure,

would you go beyond that if necessary?

MR. TENERELLA: We'll probably lock into a tighter figure during design, but it won't vary too much from that figure.

MR. RICCOBONO: The ponds and the fish, you said fish were tested, how did they show up?

MR. MOESE: No, we didn't do tests on the fish. What we did was, we assumed bio-accumulation of the fish of the contaminants in the water and the sediments. The chemicals that were found in the sediments were both naturally occurring metals and what-have-you and it didn't pose a problem to a person eating fish from the pond.

MR. RICCOBONO: You referred to beryllium at the bottom of the ponds, in the sediment of the ponds. Did you do anything for the removal of that or not?

MR. PORUCZNIK: No. I believe that the beryllium was a principal contaminant, but at the same time didn't present any risk that required remedy.

MR. TENERELLA: Our risk figures are pretty conservative. I mean, for cancer risk, for example, it's one in a million, around that range, when we would consider taking an action. And we have something called a hazard index for non-cancer risks and they're pretty low. That allows for those kinds of assumptions where the data might be a little imprecise to make sure if we're going to error at all, we're erroring to the side of public health or environmental protection as opposed to making a decision that's not protective enough. If we tend to be guilty of anything in our risk management decisions, it's to be more careful than less careful in case there's some variance in the data.

MR. RICCOBONO: With your air sampling did you see any problems off site?

MR. MOESE: No.

MR. RICCOBONO: None at all?

MR. MOESE: Those were collected prior to the drums being removed from the site in 1989 and '88.

MR. RICCOBONO: Your disturbance of the site, you'll take all the proper precautions?

MR. MOESE: We have to during our work.

MR. RICCOBONO: Thank you.

MR. HORBAT: Sandy Horbat. I teach environmental science. I'm Chairman of the Environmental Commission in East Brunswick.

When you talk about removing the cubic yardage at the bottom, the excavation is twenty-seven hundred cubic yards. I'm assuming that's also soil, but it's partly groundwater. Twenty-seven hundred cubic yards is a measurement for solids usually.

MR. MOESE: Soil.

MS. HORBAT: But in this case that's one way to treat the groundwater, by removing that soil.

MR. TENERELLA: We're removing the soil as a principal source of groundwater. Sometimes it's easier to pump harder and get the groundwater and other times it's easier to take the soil out, it's more effective to treat. In our discussions with the New Jersey DEPE we came to a determination that in this case soil removal is the way to go for the parts of the VOCs and it will increase the efficiency and decrease the time available to do the pump and treat system in the groundwater after it.

We didn't want to mislead you that it was a risk basis, unlike the arsenic. The arsenic removal of soils is a risk basis. We want to get those portions of soils out because of levels. In the VOC removal it's to effectuate the cleanup of the groundwater. It doesn't mean if someone is out there touching the ground in that area where there's VOCs or something there's a problem.

MR. HORBAT: As you remove this stuff and I guess in most cases you're talking about taking it off site, it's going to remain off site, do you have any obligation to replace that amount of ground that you're removing?

MR. TENERELLA: It depends on the site, whether we bring in clean fill, whether that's needed or whether we just redevelop topography that's there. Basically, reconfigure the site a little bit.

It depends on the site.

MR. MOESE: We included fill.

MR. HORBAT: The contaminants that you talk about are also the contaminants that we hear mentioned in wells and so on and so forth. What's the general density of those contaminants? Would you say they're greater than water or less than water; and if you drop these contaminants into water, will they tend to sink to the bottom or will they continue to float on the top?

Did you make any generalization? Would some of them be more dense, some of them less dense?

MR. RICCOBONO: Most of them are more dense.

MR. HORBAT: More dense?

MR. RICCOBONO: Right.

MR. HORBAT: You have to realize that there's a lot of people that hear you saying that Fried is not the cause of this contamination in wells. I don't know what the average depths of these wells are. I mean, I hear one man saying a hundred and fifteen. Do you know?

A VOICE: Two hundred.

MR. HORBAT: I don't know if anybody else has any data on wells, maybe you guys know, but to me there's a lot of people that may just never believe you unless you go down a hundred and fifteen feet or two hundred feet and check down there.

I personally believe that maybe you're missing something. You can sit here and say that the data that you collected does not indicate that Fried is contaminating, but you're also talking to me mainly about surface water, surface water that has become groundwater and maybe has gone down only to the eighty feet that you tested.

You know, for you guys to sit there with fair assurances that Fried is not the contaminant site of these wells, I just don't see how you can because you only have one well that's close to the road and it's only eighty-five feet deep according to what you just said.

MR. MARSENISON: You have to remember, though, that even though they may be lighter or heavier than water, the groundwater gradient is still away from those wells. There's no way those contaminants can move upstream.

MR. HORBAT: There may be breaks in the bedrock that link one aquifer into another aquifer.

MR. MARSENISON: The bedrock is all one aquifer until you --

MR. GIRINZO: But it's all sugar sand out there.

MR. MARSENISON: It's all fractured bedrock. It's all interconnected. There's no way you can move up gradient, it has to go down.

MR. GIRINZO: Once you get down a hundred and fifty feet there is no up and down, right?

MR. MARSENISON: Absolutely there is. There always is. If you think about a stream, if the stream is flowing in one direction, no matter how far down you go in the stream it's still flowing in the same direction.

MR. GIRINZO: I'm not criticizing what you're saying or saying you're wrong, but what's to say that a hundred and fifteen or two hundred feet down that stream is not running in the opposite direction across our wells? It's kind of obvious we all came up with the same results, the same contaminants.

MR. TENERELLA: If this area -- for example, there are two aquifer systems in the area. If this area had three aquifer systems, then your analogy would be correct, that we sampled the top one and the middle one and you're talking about a lower one which is going this way, where the middle one is going the opposite way.

That's possible if you had three, but in this case we only had two aquifer systems. Once you hit a defined aquifer the flow is stable in a direction. Once you have a stream the water flows in a given direction. Same thing in aquifer segments in discreet aquifers. So here we know we have two.

There's another site that I work on that I have four. So I have four zones in the aquifer all operating different ways. Very confusing and we see that kind of situation happening, but that's very unique. Here it's two. That's how we're sure about the aquifer and the flow of that in the direction of that lower aquifer here going away from the site.

When we first did our remedial investigations we made the same assumptions you did, that the general flow in the whole area is toward Fresh Ponds Road. You got contaminated wells and we got Fried Industries, A plus B, sitting there. Not a problem. When we started looking at the area – that's what took so long. It was almost three million dollars, which is quite a lot of money for a remedial investigation for a site of this scale and size. One of the reasons was, groundwater was assumed to flow one way and we provided that it was going the other way. That's why we're very confident with it now, but it took us some time to make sure we were comfortable with that. We didn't come to that decision very lightly because it took us a number of years.

MR. RICCOBONO: Tony Riccobono again, town councilman.

I think what I'm hearing here, though, is you came down to solve our problem, you found the Fried site, you're fixing that. That's nice, but what about my problem?

I think that's what I'm hearing. Nobody is using those wells, thank God, but what about my problem?

MR. GIRINZO: At our own expense.

MR. JAMESON: Marcelias Jameson from New Jersey Department of Environmental Protection.

When we were taking a look at the problem with Fried we found no connection between the home across the street and the Fried property. As we walked along the street we saw there was another building besides there, that's the Department of Parks building. County Parks Department. And we were noticing that there was fairly new pavement and it looked like some work had been done there. We started checking around. We come to find out they have underground storage tanks. It's gasoline. So we did some additional checking with their underground storage tank program, which is called BUST. We come to find out in '90 there was a recorded leak. That was recorded by the Department of Parks.

The Department then went out and did a leak test on the tanks, found that the tanks were not

sufficiently sealed, pulled those out, and at the time they were pulling them out a leak did occur. About four thousand gallons of gasoline.

That may not be your current problem, but what we're saying is, I don't know how long those tanks were there. I don't know how long those tanks were underground. So it's a possibility that they leaked sometime in the past. But the situation now is that the underground storage tank program is handling it. As a matter of fact, there is a plan put together by the County of Middlesex Department of Parks to remediate that problem.

Now, if you say you're finding gasoline-type products in your wells --

A VOICE: Industrial detergent.

MR. JAMESON: -- I can't answer that, but what I can say is, that is one additional situation that could be occurring. Now, there may be others.

MR. RICCOBONO: It could be occurring, but he'd like to find out where it came from in the first place. I think he'd like to see that so he can feel comfortable and I think he has the right to do that.

MR. JAMESON: What we're trying to do is give as much information as possible.

MR. RICCOBONO: We're not going to stop at Fried. We found that it's not Fried, let's see what's happening next.

MR. JAMESON: The health department is probably your next option, and you might want to get your wells checked again. Also, I'll give you the number and name and you can contact the underground storage tank program.

MR. GIRINZO: We received a letter last week from the County. They want to come and do tests on the wells in our yards. Is that you?

MR. JAMESON: No, we're with the state. The health department has their own.

MR. McGOWAN: You talked about how you disagree with this man's statement that it could be from Fried's chemicals that's contaminating wells, but then you're refusing to even go check it.

The other man's over there is two hundred feet deep. Why not dig a well two hundred feet deep or how deep the deepest well is across the street and then decide for yourselves and then you can tell these homes, "Okay, Fried Industries is not contaminating your wells, it's some other place"? You go to the County Parks and check out the underground tanks then.

It sounds like you spent so much money now, why not spend a little more to re-assure what these people were drinking before is not from Fried and not the chemicals that he was dumping?

MR. TENERELLA: We've done the tests we felt that are necessary. I don't know if anybody here can give you a better analogy and explain to you why we think technically or why we're sure of ourselves. We've done enough tests on the groundwater to be very comfortable --

MR. McGOWAN: Why not be positive?

MR. TENERELLA: As positive as one could be scientifically in terms of the data we've taken.

I don't know how to answer your question any more than that. There is nothing to point for us in terms of the scientific evidence that we've collected, and that's after two remedial investigation cycles because of our own questions along that line to say that there's a problem in the wells. We tried to explain this aquifer system to you in terms of how groundwater flows and why you can make those scientific judgments. I'm not sure how else to convince you. We can't just go out and spend money because someone says, "I don't

like what I heard scientifically, spend some more money."

I don't understand the question, I guess, or the problem you're having with it.

MR. McGOWAN: These people are not sure whether their wells are being contaminated by Fried or not. You say it's not, but then, again, your wells are only eighty-five feet deep; whereas, their wells are two hundred, a hundred and fifteen feet.

Why not go to that point and re-assure, spend a little more of the taxpayer's money, and then it would satisfy the homeowners. It also would save you money in the long run. If private testing is done and it was from Fried, then it might save you a lot more money in the end.

MR. PORUCZNIK: I'd like to mention one thing. Maybe mention Dick Spillatori. He sent me some data about a year or two -- about a year ago. Apparently, the County has tested a lot of the wells in this general vicinity and there may not even be a problem now.

Maybe, Dick, do you mind if I refer that to you to maybe say a statement on that?

MR. SPILLATORI: Right now we haven't tested in that area at least for a year. Anyone that would be interested in having their wells tested we'd be more than happy to send someone out to do the testing.

What we found on several occasions is that a lot of times the cause of some of the contamination problems could be one septic system and what could have been dumped into it in terms of a cleaner. Sometimes they have alter organics or volatile organics in those type cleaning agents which could contribute to the problem. I say could because anything could contribute to a problem.

MR. PORUCZNIK: What I had in mind, though, remember you sent me a package on wells based on data in '90, '91, '92? I was trying to compare those similar wells to the data we took in '89.

MR. SPILLATORI: I don't know the numbers in terms of the concentration. I could find those figures out.

As I mentioned, anyone that has a well that's not in use or used for irrigation, we'd be happy to test it. That's free of charge. You just have to call our office.

MR. SCHRAGER: Larry Schrager, 40 Livingston Avenue, New Brunswick.

On the diagram where you showed the groundwater contamination plume --

MR. PORUCZNIK: The one that was blue?

MR. SCHRAGER: Yeah, the one with the blob overlying the site.

What was the contaminant?

MR. TENERELLA: How did we define the plume by contaminant?

MR. SCHRAGER: What was the contaminant that you used to define the plume? You have multiple contaminants.

MR. PORUCZNIK: There was a number of contaminants that we used to define the plume, benzene, toluene, soluene, 111 trichlorethane.

MR. SCHRAGER: What was the contaminant that defined the plume that you drew?

MR. MOESE: It's not a single contaminant. It's based on, basically, what we found. Either the

upper aquifer would intersect the surface water or it, basically, reduced to almost nothing at that point.

MR. SCHRAGER: At the leading edge of the plume then what is the contaminant?

MR. MOESE: I believe it was most likely vinyl chloride that may have already reached 10S or 10D. It's a very fast moving compound in groundwater.

MR. SCHRAGER: 10D is a deep well?

MR. MOESE: Yes.

MR. SCHRAGER: Was the concentration higher in the deep well than in the surficial well?

MR. MOESE: No, 10D was probably one or two parts per billion, which is well below EPA's NCL level.

MR. SCHRAGER: Ten or two --

MR. MOESE: One or two micrograms per liter.

MR. SCHRAGER: So either equal or twice the state limit for that contaminant?

MR. MOESE: The Jersey groundwater quality standards for vinyl chloride is point zero eight, the federal is two. The maximum observed in the surficial aquifer is five hundred parts per billion.

MR. SCHRAGER: So that's six or seven times the state limit?

MR. MOESE: Right, with the quantitation limit being five.

MR. SCHRAGER: Being five?

MR. MOESE: Being five parts per billion.

MR. SCHRAGER: You mentioned you were surprised that you found groundwater flow coming upward toward Bog Brook. Now, that groundwater flow is, presumably, not carrying vinyl chloride. Is the vinyl chloride sinking?

MR. MOESE: No, it would still follow the groundwater flow.

MR. SCHRAGER: What I'm trying to get to is, what is the vertical profile of the contaminants and do you have a breakdown?

I imagine these reports are very voluminous and thorough, but of the different contaminant plumes because to show us an amalgam of the plumes really doesn't tell us about what's happening with the different chemicals and the chemistry of the area.

This plume is a result, presumably, of maybe twenty or thirty or more years of disposal on the site and the extent of the plume is, basically, within the site. Now, of course, that's rebutted by some people in the audience and, certainly, I'm sure it will be something that you look at later on. But if the plume has remained within the confines of the site, what is the tracking over time of where the plume will be and why do you presume that the plume will travel as far as it is if that plume diagram that you're showing is accurate?

It seems either the plume diagram should be much larger or the assumptions about the remedial effort are overstated.

MR. MOESE: I think what's important to point out here is, what happens is, as you go north along the site you no longer have an upper aquifer. Well, 10D is out in almost the northern most corner of the

site. There is no surficial aquifer there. When we drilled, we drilled through probably six feet of sand before we hit clay. In that six feet of sand, at the surface of the clay there may have been a little moisture in the sand.

MR. SCHRAGER: When did you hit bedrock?

MR. MOESE: I'd have to check the logs. I don't remember off the top of my head how deep bedrock was, but it's definitely closer than it is over this portion of the site.

What happens is, bedrock rises as you get out in this area. It's relatively deep here and it's shallow here. The upper aquifer thickness at well 7S from surface to clay is six feet.

MR. SCHRAGER: So it's presumable, actually, that there could be motion along the interface of the surficial system and the shale below, and that might explain why some of the people on the opposite side of Fresh Ponds Road --

MR. MOESE: We have bedrock wells on the site.

MR. SCHRAGER: Well, you described the contour, the upper surface of the bedrock, to me.

MR. MOESE: But the bedrock flow is still north, northeast.

MR. SCHRAGER: That's flow in the bedrock, not at the interface. And if he's picking up at a hundred and fifteen feet --

MR. MOESE: The interface of the sands and --

MR. SCHRAGER: -- and the surficial aquifer.

MR. MOESE: You have up to thirty feet of clay in some areas here of thickness between the surficial aquifer and the soil.

MR. SCHRAGER: We also know that the bedrock aquifer is contaminated.

MR. MOESE: Well, underneath the building area you do have a fairly thin level of clay, which either was reached during the clay mining operations or it could have traversed the clay somehow.

MR. SCHRAGER: Fractures in the clay.

MR. MOESE: Fractures in the clay.

It's still not going to -- I mean, the wells here that were screened are screened right on top of the clay at these locations.

MR. SCHRAGER: Your shallow wells.

MR. MOESE: Yeah.

We see no contamination over here at all. I mean, these wells are perfectly drinkable in the surficial aquifer.

MR. SCHRAGER: Are they

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traffic. There's concerns about the roadway.

One of my other questions is, who do you consider to be most egregious and why?

I know that there were children --

MR. TENERELLA: Your questions are getting so long it's hard to give you definitive answers. Can we take these one at a time and carefully?

Let's start with the remedy and burden on truck traffic.

We're well aware of that. We're well aware there's limited access in and out of this area and it's a relatively residential area. That's a down side.

No more than in terms of trucks coming in in residential and construction of building homes, but truck traffic, heavy equipment, that's going to happen.

We recognize that in any residential area where we have to do a Superfund site and remediation. What we'll do in design is come back to the Town during the detailed design activities to discuss things like traffic route, safety, security, contingency plans for the site and those kinds of things. We're very aware of those things even when we select those kinds of remedies and we're looking for other alternatives to get around that where we can, and where we have to do excavation, limit the area where we excavate, limit truck traffic, reschedule.

A lot of that detail we don't put into our record of decision other than the conceptual remedy, but, certainly, the design activities, we'll be back again to discuss those.

MR. SCHRAGER: Is the site still accessible to people in the area?

MR. TENERELLA: If they really want to get on it, sure.

MR. SCHRAGER: Because it seems like if soil contamination is one of your great concerns --

MR. TENERELLA: We don't have an acute problem anymore. We did at one point and that's why we did the removal action. That's why we had guards on the site for a while. Once the high concentrated chemicals in the facility were removed, that burden was removed, and all the problems now are long-term chronic or chronic potential as opposed to some kind of acute problem when we had the chemicals there.

MR. SCHRAGER: It would be nice if instead of spending eleven million dollars in cleanup and getting a site that someone will put a new residential development on, spending a little less and perhaps finding a park or creating a park in the nearby area for all those people that seem so fond of this area.

MR. TENERELLA: The burden of Superfund is not to remediate.

MR. RICCOBONO: I don't think that's their problem.

MR. SCHRAGER: We all are contributing our taxes to government, obviously. Not to make a social comment on government, but there are benefits being derived from changing our choices; and one of them is, if we see that the route of contamination in this case seems to be centered so much around the soil and we know that the site is used by kids and adults and fishermen, et cetera, that it seems that a more beneficial use might be to try to do a cleanup in the way that preserves some funds to provide these people with an alternative to the place they have been going to now, which the EPA has decided is hazardous to one's health.

MR. TENERELLA: The Superfund law has not been formulated by Congress to allow that kind of expenditure and we operate under the law as it's structured by Congress. There's no allowance for doing something like that in the law. If you want to suggest that to your Congressman for modification to the law, by all means.

You have to recognize that EPA operates under a strict scripture of the Superfund laws passed by

Congress and regulations that reflect that, and part of that is a very realistic concern by Congress that Superfund sites cost a lot of money to clean up and there has to be some reality in terms of the kinds of money that are spent with our biggest concerns being protection of public health and protection of the environment. And where we can get someone else to pay for it, the companies that are responsible, to make sure that happens, and where that doesn't happen, to be careful where we can in expending public funds. Unfortunately, with this particular cleanup, especially, it's going to be funded by public funds. The cleanup decision doesn't change. Whether the public pays or EPA pays, the policies are set.

It would be nice if we could take some money and do other options, that's true in all of government, but that's not how government works in any case, to shift money between programs like that.

MR. BRUNO: Charles Bruno from East Brunswick.

What kinds of experience have you had in pump and treat systems like those pump and treat systems when you have volatile organics, heavier organics?

Pump and treat you're going to be removing the water. Are you going to come back and watch it later on and get what's still attached to the soil?

MR. TENERELLA: Pump and treats are relative technology. Pump and treats are still going on in a lot of sites right now.

MR. BRUNO: What's the rate of success on it? I followed some of it and some of it has not been very successful because you have materials that are not water soluble, they're floating on the top or bottom. Who's to say when you're pumping the water out how much of these materials you're going to get?

MR. TENERELLA: Depending on the geology of the site and design, the pump and treat system will be designed to compensate for some of that site by site. The biggest question along that line normally is how effective will a pump and treat be over the long run in terms of getting down to groundwater that's drinkable.

MR. BRUNO: I don't know how you evaluate it. I'm not familiar with exactly how you tested it to find out whether this process is going to work. I'm not privy to that information. I just want to know, did you evaluate it that way?

MR. TENERELLA: Conceptually. In design we'll have to get into detail in terms of well locations, pumping rates, where the wells will actually be located in terms of depth, those kinds of things. We'll be pumping and then treating the water at a plant and then surface discharge in the area.

MR. BRUNO: When you do the excavation of the volatile soil are you going to have something to prevent volatilization to occur?

MR. TENERELLA: Yes. Depending on the kinds of levels that we're seeing and, again, in design one of the things that we do when we are doing our site cleanups is, we have to coordinate all of our designs very close, not only the selection of the remedy, but the design, with the Department of Environmental Protection & Energy. It might consist of protections for the workers who are right there working with their head in it, or if there's a potential for any kind of volatiles going off site at any kinds of levels that would create any kinds of difficulty to the public, then we'll start different containment procedures.

MR. BRUNO: The investigation, I know he mentioned aerobic and anaerobic biodegradation. I don't know to what extent this was studied. I wonder what the outcome was on tests along those terms?

MR. TENERELLA: In terms of the exact treatment we'll use?

MR. BRUNO: Bioremediation in regards to soil or groundwater treatment.

MR. TENERELLA: In terms of treating those alternatives?

MR. MOESE: Generally, it was ruled out from the feasibility study at the time because it's evenly proven for certain types of organic compounds. With the range of organics that we have in the soil or the groundwater at these locations we didn't feel it was going to be feasible for this site.

MR. BRUNO: Maybe when you did the original feasibility study, but at this time I know that the B-text products and also your algae and hydrocarbons would be in groundwater.

MR. MOESE: Well, what I could do, I have my feasibility study lead right here, who's behind you. He helped write the feasibility study.

MR. CHOZICK: Basically, there were no feasibility tests on this particular site. As you pointed out, yes, bio has been shown now to be effective for B-text compounds and some of the other compounds on the site. The difficulties, biotreatment is still relatively new technology, particularly in these applications. So you're hesitant to jump right into it on these sites.

There are some compounds on this site that aren't biodegrading, so you need a treatment subsequent to the bio anyway. Also, the concentrations on the site were fairly low, which causes problems in biotreatment. So since you would need to have either air stripping or carbon downstream anyway and the concentrations are so low, it's much more practical to just do that treatment alone.

MR. BRUNO: I thought it was more difficult on air stripping to remove lower concentrations.

MR. CHOZICK: Actually, they opted for the carbon, it indicates, probably also for that reason, but air stripping would get down to treated levels.

A VOICE: How much has it cost so far?

MR. TENERELLA: Everything on the site so far?

A VOICE: Yes.

MR. PORUCZNIK: We spent approximately three million dollars on the remedial investigation and feasibility study, including both phases. I believe it was approximately one-and-a-half million dollars for the removal action. So the total would be roughly four-and-a-half million dollars of just EPA funding.

MR. TENERELLA: That's not a lot of money relative to other Superfund sites, but that's a lot of money relative to the size of this site and the scale of it. One-and-a-half million dollars of a small industrial site like this is a lot of money, but there was a lot of material to pull out. The remedial investigation, up to three million, is also pretty high for a site of this size.

A VOICE: You project eleven million to finish the job?

MR. PORUCZNIK: Yes, that's our estimate right now, and that's for the implementation.

MR. TENERELLA: And that's low in terms of the average for Superfund cleanups in New Jersey. Average cleanup cost in New Jersey runs something around twenty, twenty-five million now. An average site. This is below average in terms of the scale of the cleanup.

MR. SCHRAGER: Larry Schrager.

You mentioned the extent of soil contamination. You showed a diagram with a number of boxes and rectangles around certain areas. Are those for the cumulative thirty-seven hundred yard excavation?

MR. MOESE: Yes.

MR. SCHRAGER: And you had one pile to the far northeast section of the site. It says, if I'm reading it properly, "Rubble Pile."

MR. MOESE: That's next to it.

That, actually, would be, if you're looking at the figure, to the right of it. This is sort of in between it. The rubble pile you're looking at is right here, in this area. The excavation area is actually here.

MR. SCHRAGER: Oh, so the rubble pile was not contributing in your estimation to the surface contamination?

MR. MOESE: No, that was all Jersey barriers and such, highway dividers in that rubble.

MR. SCHRAGER: It sounds like the total cost for the cleanup might run around fifteen million dollars plus. I just thought it was interesting that the approximate cost for building a state-of-the-art landfill is about five hundred thousand dollars an acre and the Fried site fits right in with that, five thousand dollars an acre for a sanitary landfill. It's a little upsetting --

MR. TENERELLA: This would not be defined as a sanitary landfill. It would be designed as a hazardous waste landfill if we had to do that here. Plus, the area would then have to be restricted for future development.

MR. SCHRAGER: I'm not suggesting that this become a sanitary landfill, I'm just pointing out for the same five hundred thousand dollars an acre we build sanitary landfills.

MR. TENERELLA: What I'm going to suggest, I'm not sure if there's anymore questions that are of a general nature, if we want to get into very technical questions, some other people may not be interested in them, is that we would stay and answer questions, more detailed questions, if you have them.

Does that seem amenable to everyone?

That would break into a more informal session up here. If you have some further questions, we'd be happy to stay.

Thank you very much for coming.

(Proceedings concluded.)

C E R T I F I C A T E

I, RUTHANNE UNGERLEIDER, a Certified Shorthand Reporter and Notary Public of the State of New Jersey, certify that the foregoing is a true and accurate transcript of the proceedings, on the date and place hereinbefore set forth.

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